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気象庁海洋月報は、気象庁 気候・海洋気象部 海洋課で作成しています。
本月報に関する問い合わせは、

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Monthly Ocean Report is prepared by the Oceanographical Division, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2000 年 10 月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for October 2000 in the Pacific Ocean.
Areas of positive anomalies are shaded.

Table of Contents

	Figure	Page
Highlights [illegible]		1
Oceanographic conditions in the western North Pacific Ocean and [illegible]		
Conditions for this month		
Sea Surface Temperature (SST)		
[illegible] mean SST and anomalies in the western North Pacific		
Monthly mean SST and anomalies in the western North Pacific		
Subsurface Temperature		
Subsurface temperatures at the depths of [illegible]	4	
Ocean Current and Sea Surface Height		
Sea surface current in the western North Pacific		
[illegible] of the Kuroshio [illegible]	6	
Sea surface dynamic heights in the western North Pacific		
Sea surface current vectors in the western North Pacific	11	
Temporal variations		
Sea Surface Temperature		
Time series of ten-day mean SST anomalies in the western North Pacific		
Time series of [illegible] along [illegible] of Japan		
Sea Level		
Time series of sea level [illegible] along the coasts of Japan	14	
Ocean Data Buoy Observations		
Oceanographic conditions in the global and Pacific Ocean		
Conditions for this month		
Monthly mean SST and anomalies in the global ocean		
Subsurface temperature [illegible]		
[illegible] Pacific Ocean		
Monthly sea surface [illegible] in the Pacific		
Monthly [illegible] surface height anomalies [illegible]		
Long-term variations		
SST in the Global Ocean		
Long-term [illegible] of monthly mean SST anomalies		
Equatorial Pacific		
Time series [illegible] anomalies in the equatorial Pacific Ocean		
El Niño Monitoring [illegible]		
Time [illegible]		
Time [illegible] of ocean heat [illegible]		
the [illegible] in the Pacific Ocean		
Time [illegible] of [illegible] temperatures		
Glossary		
Sea Ice		
[illegible]		
[illegible] distribution of oceanographic data		

目　　次

	図	ページ
海況の特徴（2000 年 10 月）		1
北西太平洋及び日本近海の今月の海況		
海面水温		
北西太平洋旬平均海面水温図及び偏差図（上旬、中旬、下旬）	1-3	2-4
北西太平洋月平均海面水温図及び偏差図	4	5
表層水温		
日本近海表層水温図（深さ 100 m、200 m、400 m）	5-7	6-8
海流・海面高度		
北西太平洋海流図	8	9
旬別黒潮流軸図	9	10
北西太平洋力学的海面高度分布図	10	11
北西太平洋海流ベクトル図	11	11
北西太平洋及び日本近海の海況の推移		
海面水温		
海域別旬平均海面水温平年偏差時系列図	12	12-13
沿岸水温時系列図	13	14
潮　　位		
沿岸潮位時系列図	14	15-16
海洋気象ブイロボット	15	17-19
全球及び太平洋の今月の海況		
全球月平均海面水温図及び偏差図	16	20
太平洋表層水温図（深さ 100 m、200 m、400 m）	17-19	21-22
太平洋ブイ流跡図	20	22
太平洋赤道に沿う表層水温及び偏差の深度－経度断面図	21	23
太平洋月平均海面水位偏差図（2000 年 9 月）	22	24
全球月平均海面高度偏差図（2000 年 9 月）	23	24
全球及び太平洋の海況の推移		
海域平均海面水温偏差の長期変動	24	25
太平洋赤道域の海面水温偏差時系列図	25	26
エルニーニョ監視指数	第 1 表	27
赤道に沿った海面水温及び偏差の時間－経度断面図	26	28
太平洋の赤道に沿う海洋表層の貯熱量及び偏差の時間－経度断面図	27	29
太平洋赤道域の表層水温の時間－深度断面図	28	30
その他		
海　氷	29	31
海洋気象観測船による海洋観測結果	30	32
測点分布図	31	33-34

Table of Contents

	Figure	Page
Highlights (October 2000)		1
Oceanographic conditions in the western North Pacific Ocean and seas adjacent to Japan		
Conditions for this month		
Sea Surface Temperature (SST)		
Ten-day mean SST and anomalies in the western North Pacific	1-3	2-4
Monthly mean SST and anomalies in the western North Pacific	4	5
Subsurface Temperature		
Subsurface temperature at the depths of 100 m, 200 m and 400 m in seas adjacent to Japan	5-7	6-8
Ocean Current and Sea Surface Heights		
Sea surface current in the western North Pacific	8	9
Location of the Kuroshio axis	9	10
Sea surface dynamic heights in the western North Pacific	10	11
Sea surface current vectors in the western North Pacific	11	11
Temporal variations		
Sea Surface Temperature		
Time series of ten-day mean SST anomalies in the western North Pacific	12	12-13
Time series of coastal water temperatures along the coasts of Japan	13	14
Sea Level		
Time series of sea level and its anomalies along the coasts of Japan	14	15-16
Ocean Data Buoy Observations	15	17-19
Oceanographic conditions in the global and Pacific Ocean		
Conditions for this month		
Monthly mean SST and anomalies in the global ocean	16	20
Subsurface temperature (at the depths of 100 m, 200 m and 400 m) in the Pacific Ocean	17-19	21-22
Movements of drifting buoys in the Pacific Ocean	20	22
Depth-longitude sections of temperature and anomalies along the equator in the Pacific Ocean	21	23
Monthly sea level anomalies in the Pacific Ocean (September 2000)	22	24
Monthly sea surface height anomalies in the global ocean (September 2000)	23	24
Long-term variations		
SST in the Global Ocean		
Long-term variations of monthly mean SST anomalies	24	25
Equatorial Pacific		
Time series of SST anomalies in the equatorial Pacific Ocean	25	26
El Niño monitoring indices	Table 1	27
Time-longitude sections of SST and its anomalies along the equator	26	28
Time-longitude sections of ocean heat content and its anomalies along the equator in the Pacific Ocean	27	29
Time-depth sections of equatorial Pacific subsurface temperature	28	30
Others		
Sea Ice	29	31
Oceanographic observations on-board research vessels of JMA	30	32
Geographical distribution of oceanographic data	31	33-34

海況の特徴（２０００年１０月）

日本近海の海況

海面水温は、日本海西部を除き全般に平年より高かった。若狭湾から北の日本海東部と国後島近海、本州のはるか東及び南東で＋１℃を超える正偏差、本州東方の40゜N、150゜E付近では＋２℃を超える正偏差が見られた（第４図）。

黒潮は、九州から紀伊半島にかけて接岸した後、東海沖を東南東に流れていた。上旬は32.5゜N、139゜E付近で北に小さく蛇行した後、32゜N、141゜E付近まで南下して東に流れ、142゜E付近で北に向きを変え、中・下旬は32.5゜N、141゜E付近で北北西に向きを変えて、房総半島沖を北東に流れていた（第９図）。

親潮系の冷水の沿岸寄りの分枝は39.5゜N、143.5゜Eまで、沖合の分枝は37゜N、145゜Eまで達していた（第５図）。

太平洋の海況

太平洋赤道域の海面水温は、170゜W付近と155゜Wから120゜Wにかけて－0.5℃を超える負偏差が見られた。一方、125゜E付近と135゜Eから155゜Eにかけては、＋0.5℃を超える正偏差となっていた。

北太平洋の海面水温は、35゜Nから45゜Nにかけての日本の東と35゜Nから50゜Nにかけてのアラスカ湾の南で平年より１℃以上高く、40゜Nの日付変更線付近には－１℃を超える負偏差が見られた（第１６図）。

Highlights October 2000

Seas adjacent to Japan

SSTs were generally above normal except the western part of the Japan Sea. Positive SST anomalies exceeding +1℃ prevailed in the eastern part of the Japan Sea, around Kunashiri Island, far east of Honshu and southeast of Honshu. Positive SST anomalies exceeding +2℃ prevailed east of Honshu (Fig. 4).

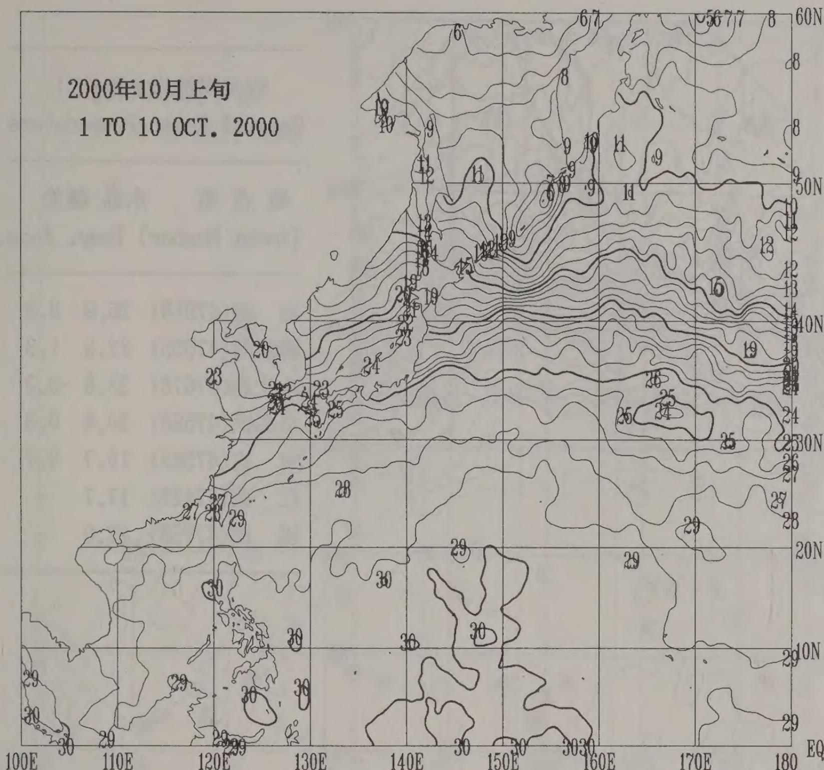
The Kuroshio flowed along the coasts from Kyushu to the Kii Peninsula, then flowed ESE-ward off Tokai through the month. In the first 10-day of the month, the Kurosio meandered slightly to the north near 32.5゜N, 139゜E, and after that it flowed SE-ward to near 32゜N, 141゜E, and turned northward. In the rest of the month, the Kuroshio turned NNW-ward at 32.5゜N, 141゜E and flowed NE-ward off the Boso Peninsula (Fig. 9).

Coastal and off-coastal branches of the Oyashio cold water extended southward to 39.5゜N, 143.5゜E and 37゜N, 145゜E, respectively (Fig. 5).

Pacific Ocean

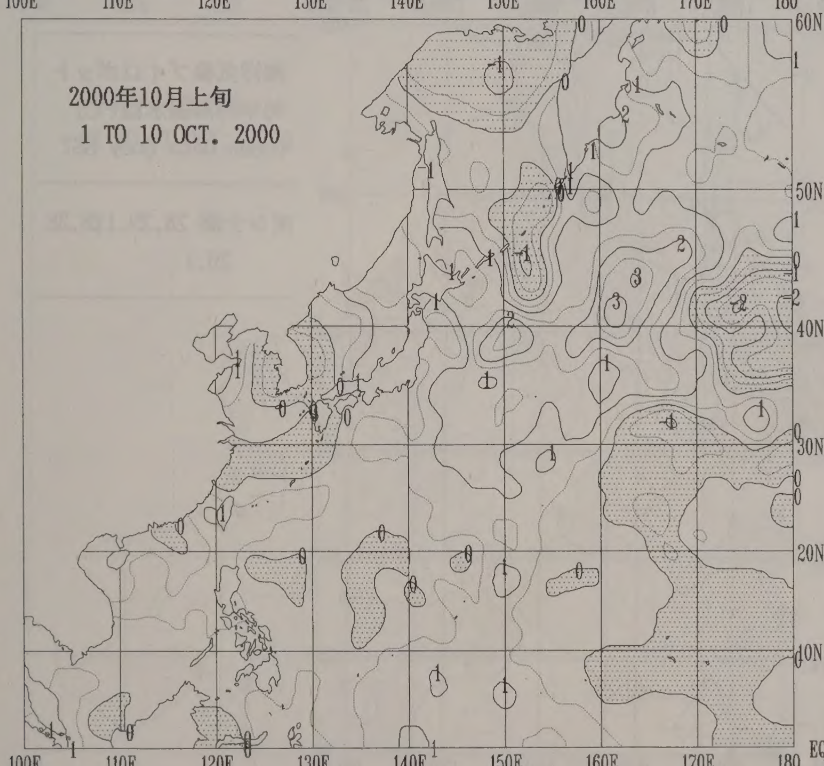
In the equatorial Pacific, negative SST anomalies exceeding –0.5℃ were found near 170゜W and from 155゜W to 120゜W. Positive SST anomalies exceeding +0.5℃ were found near 125゜E and from 135゜E to 155゜E.

In the North Pacific, positive SST anomalies exceeding +1℃ prevailed in the seas east of Japan between 35゜N and 45゜N, and south of the Gulf of Alaska between 35゜N and 50゜N. SSTs were more than 1℃ below normal near 40゜N, 180゜(Fig. 16).



旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石 垣(47918)	27.6	0.3
御前崎(47655)	23.3	1.1
八丈島(47678)	23.8	-1.2
小名浜(47598)	21.4	0.8
宮 古(47585)	20.0	1.3
江 差(47428)	20.4	-
浜 田(47755)	22.7	-

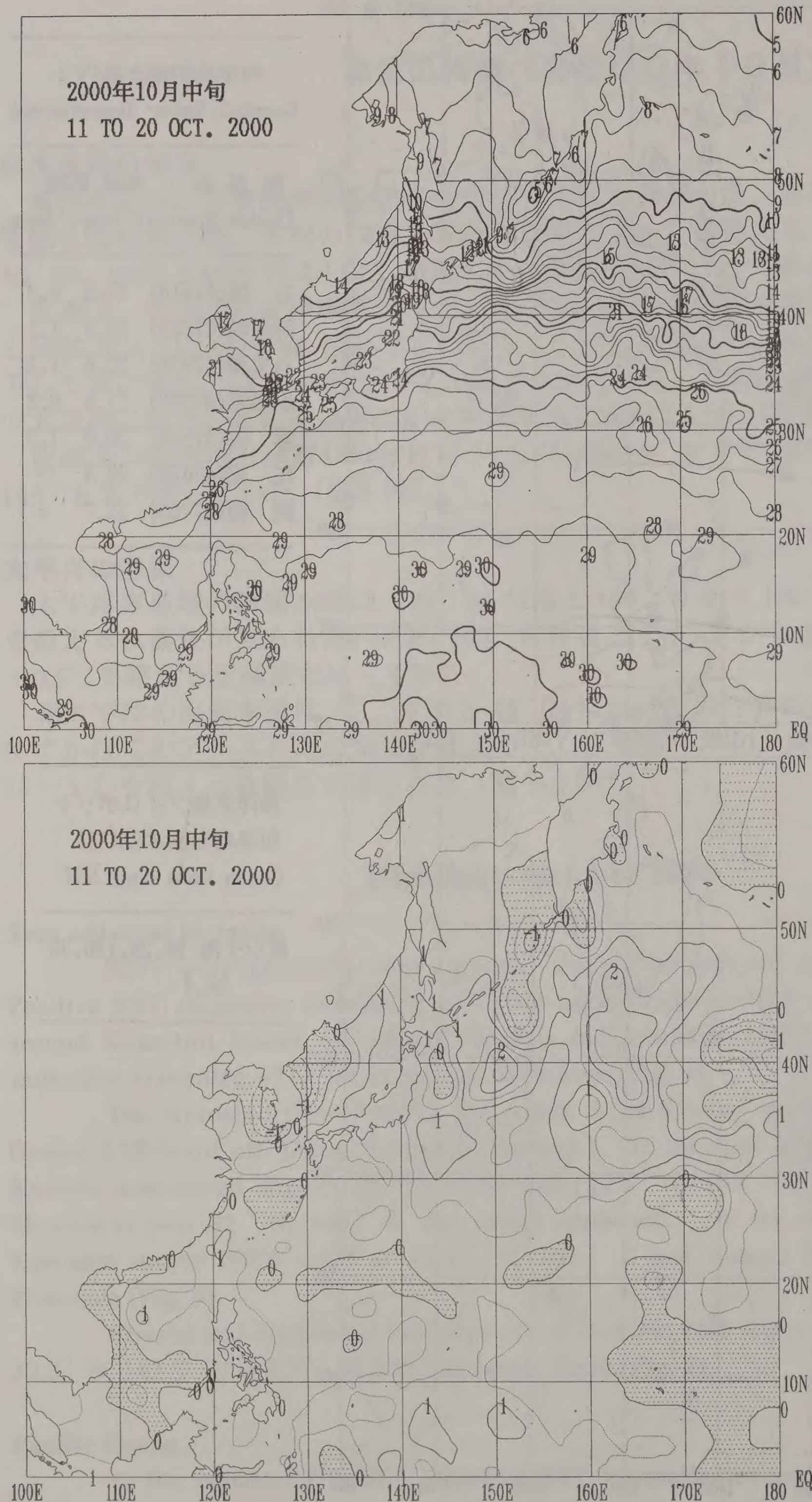


海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

東シナ海 28.2N,126.3E
26.4

第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2000年10月上旬)

Fig.1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in OCT 2000. Anomalies are computed from the JMA climatology (1961-90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



旬平均沿岸水温(℃)
Coastal Water Temperature

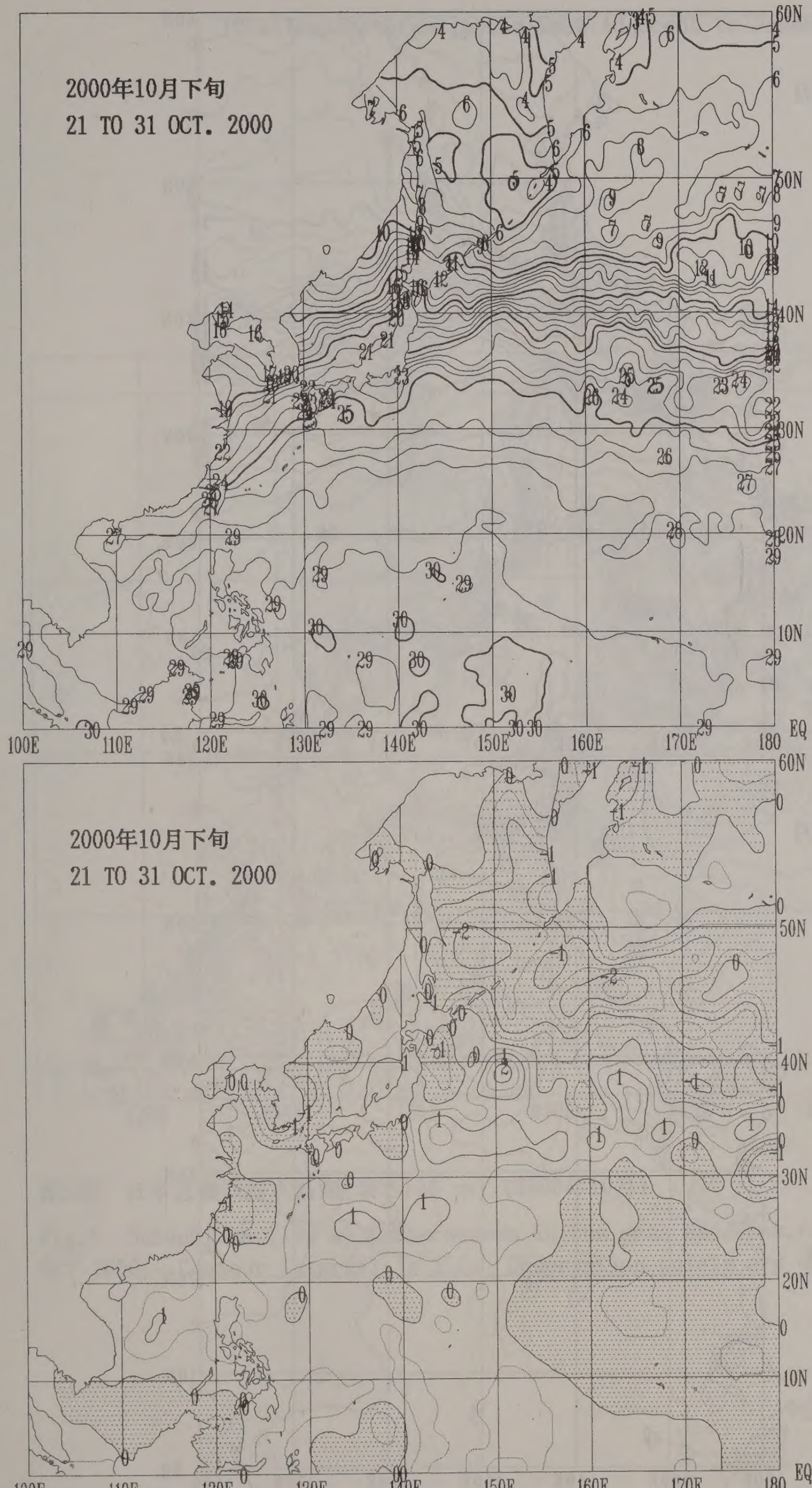
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	26.9	0.3
御前崎(47655)	22.3	1.3
八丈島(47678)	23.8	-0.3
小名浜(47598)	20.4	0.8
宮　古(47585)	18.7	0.7
江　差(47428)	17.7	-
浜　田(47755)	22.0	-

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

東シナ海 28.2N,126.3E	26.1

第2図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2000年10月中旬)

Fig.2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in OCT 2000. Anomalies are computed from the JMA climatology (1961-90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

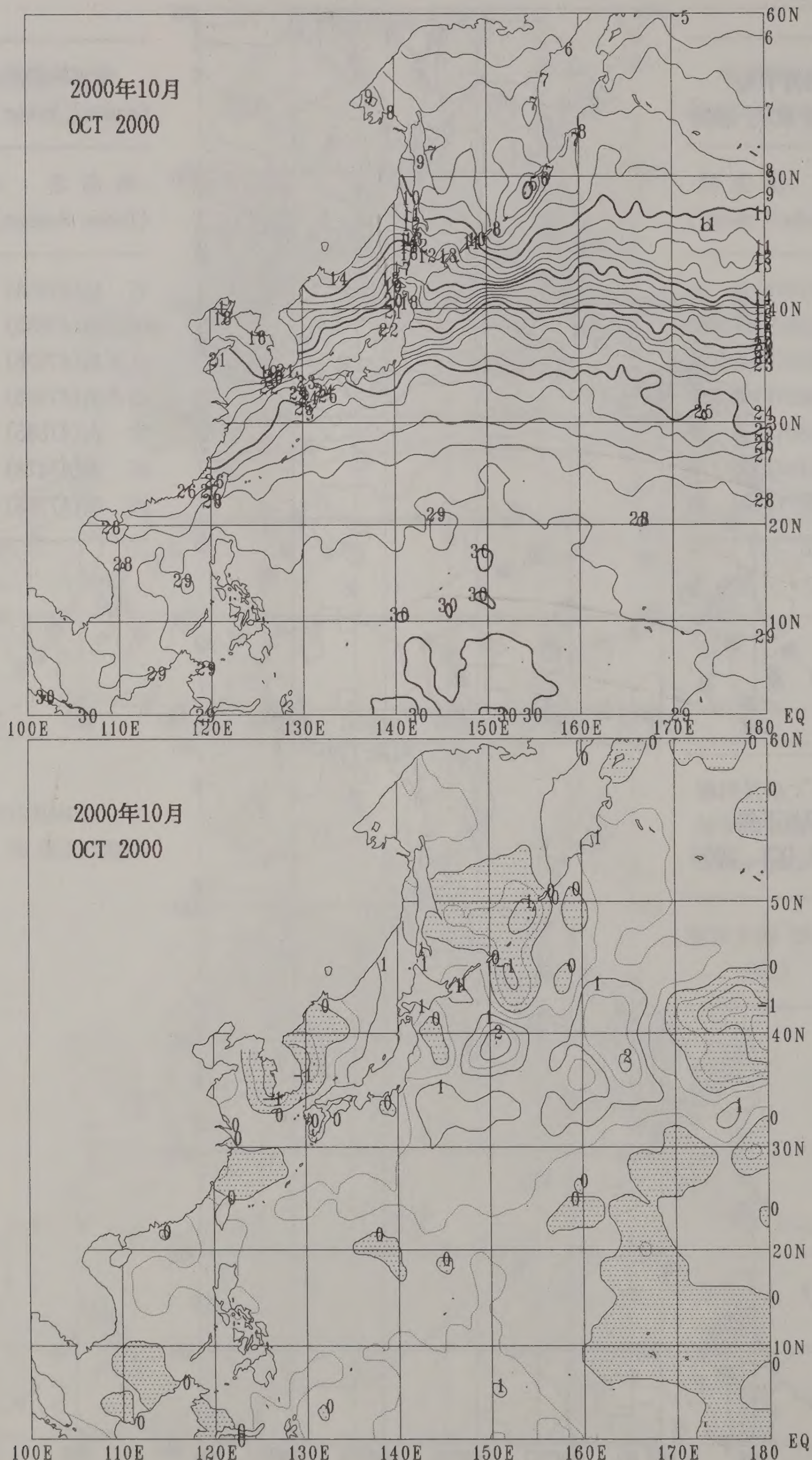


旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	26.5	0.8
御前崎(47655)	20.9	1.3
八丈島(47678)	22.0	-1.4
小名浜(47598)	18.9	0.4
宮　古(47585)	17.5	0.6
江　差(47428)	15.3	-
浜　田(47755)	20.9	-

第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2000年10月下旬)

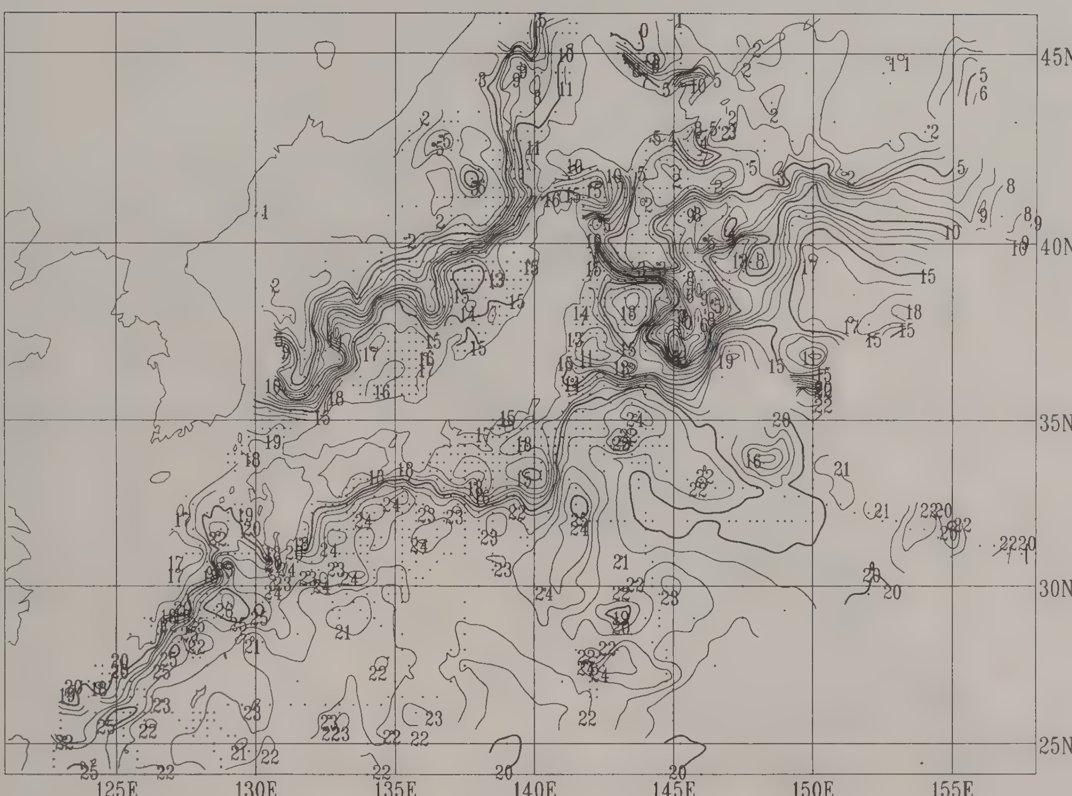
Fig.3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in OCT 2000. Anomalies are computed from the JMA climatology (1961-90). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



第4図 北西太平洋月平均海面水温図(上)及び偏差図(下)(2000年10月)

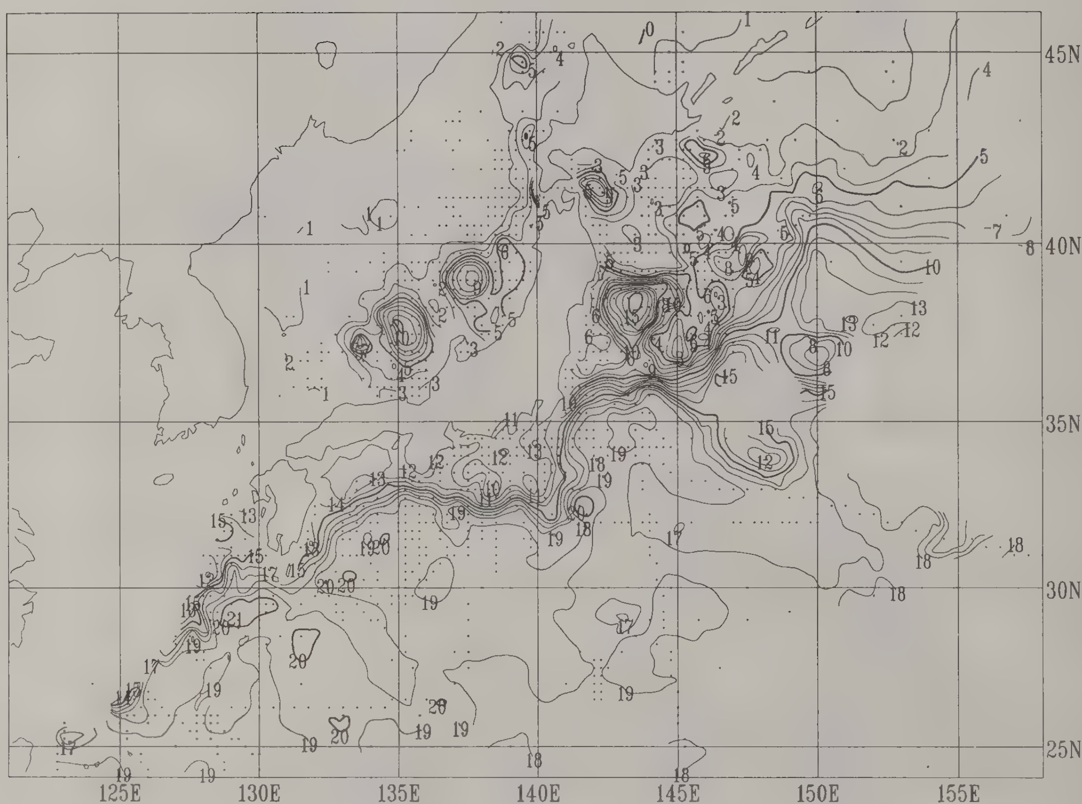
Fig.4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for OCT 2000. Anomalies are computed from the JMA climatology (1961-1990). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

100m Temperatures in the Seas Adjacent to Japan



第5図　日本近海表層水温図(深さ100 m) (2000年10月)

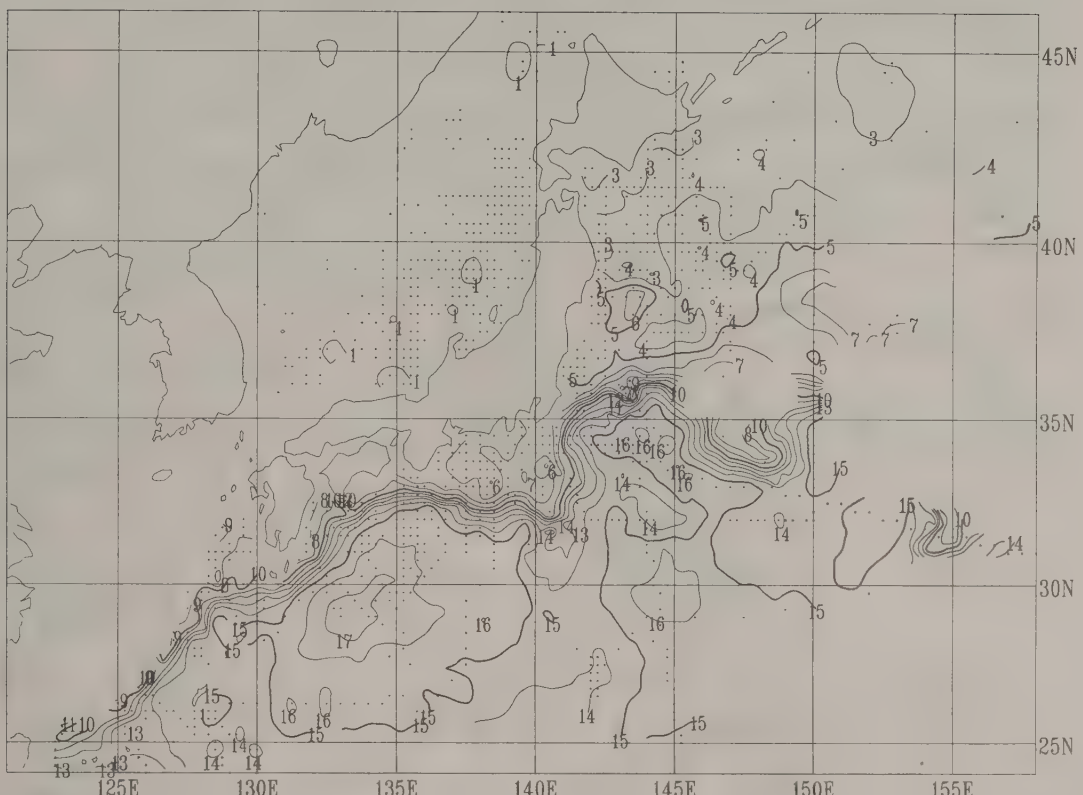
Fig.5 Subsurface (100 m) temperatures in the seas adjacent to Japan for OCT 2000. Contour interval is 1°C. Observation points are denoted by dots.



第6図　日本近海表層水温図(深さ200 m) (2000年10月)

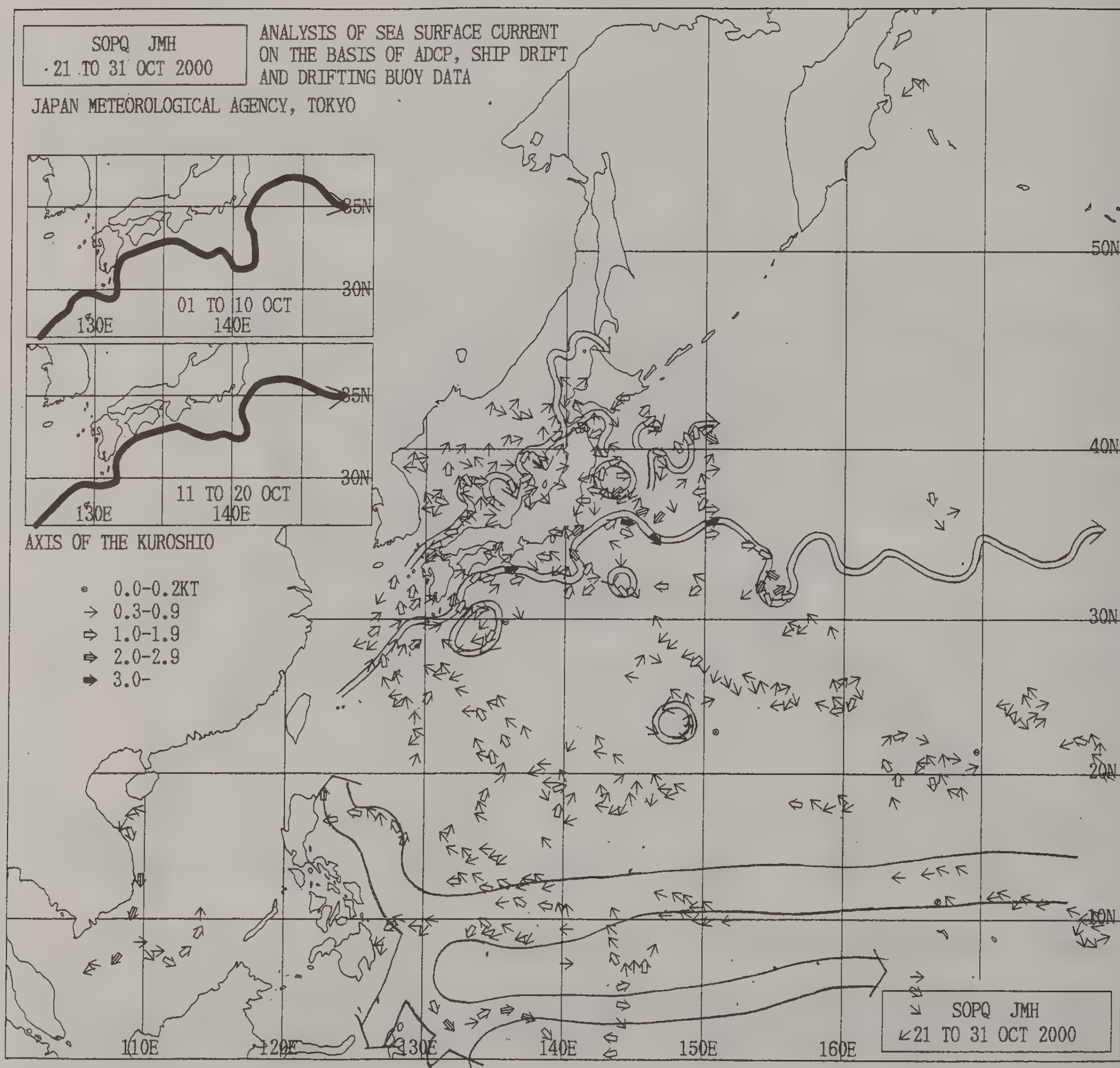
Fig.6 Subsurface (200 m) temperatures in the seas adjacent to Japan for OCT 2000. Contour interval is 1°C. Observation points are denoted by dots.

400m Temperatures in the Seas Adjacent to Japan



第7図　日本近海表層水温図(深さ400 m) (2000年10月)

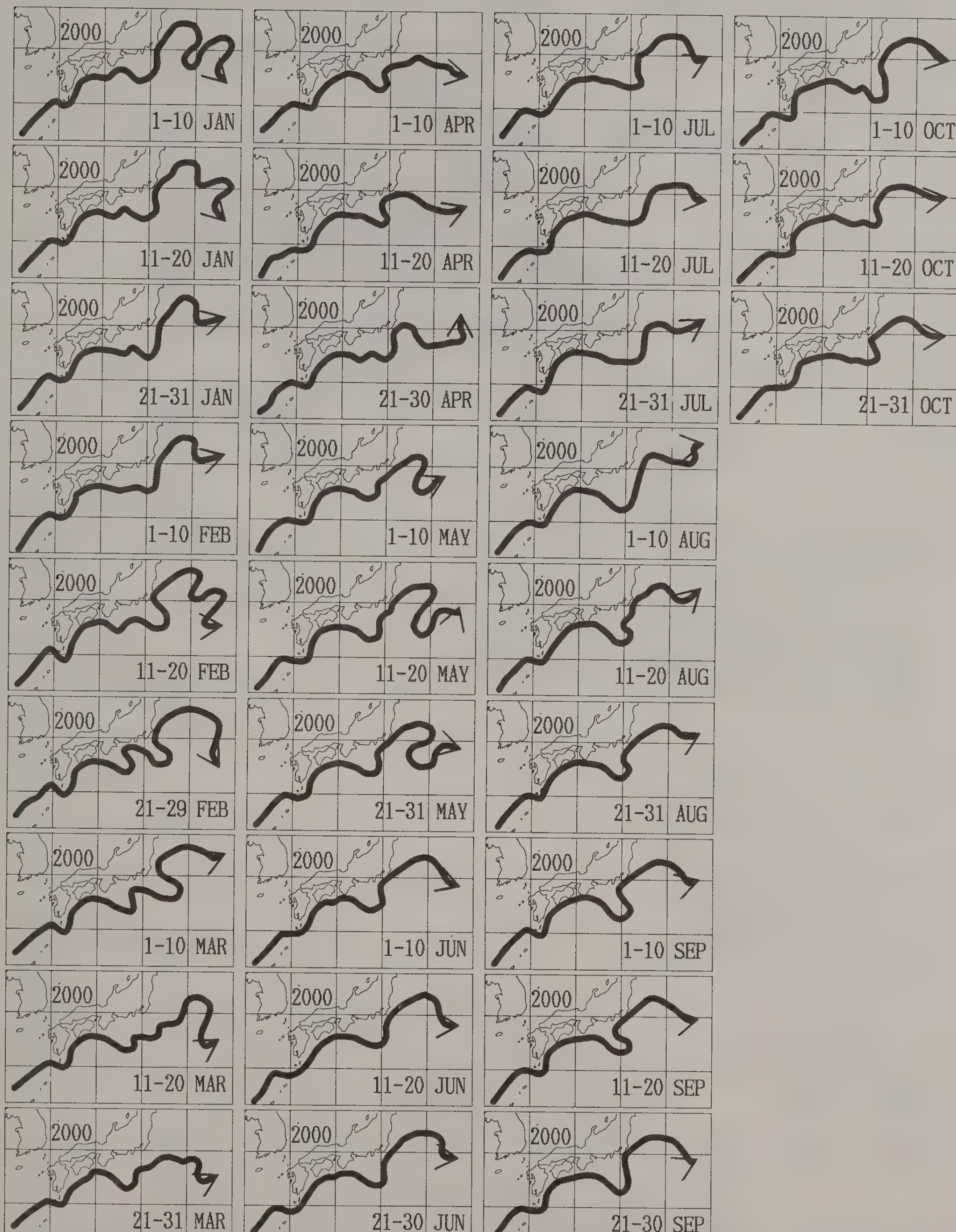
Fig.7 Subsurface (400 m) temperatures in the seas adjacent to Japan for OCT 2000. Contour interval is 1°C. Observation points are denoted by dots.



第 8 図　北西太平洋海流図（2000 年 10 月下旬）

Fig. 8　Analysis of the sea surface current in the western North Pacific for the 3rd ten-day period in October 2000. Small arrows indicate *in situ* observations. Major currents such as the Kuroshio and the North Equatorial Current are denoted by larger open arrows.

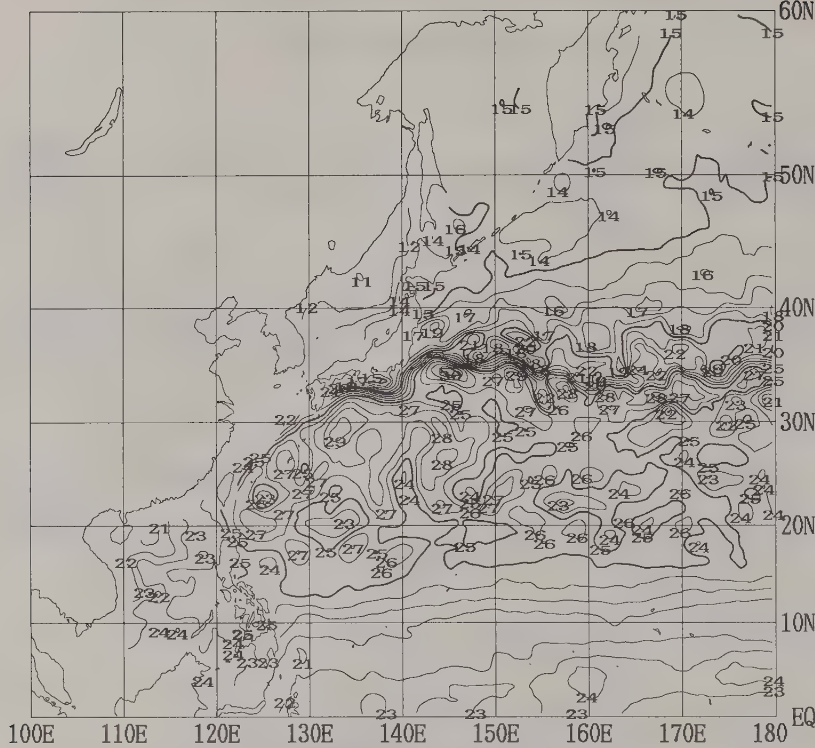
Location of the Kuroshio axis



第9図 旬別黒潮流軸図

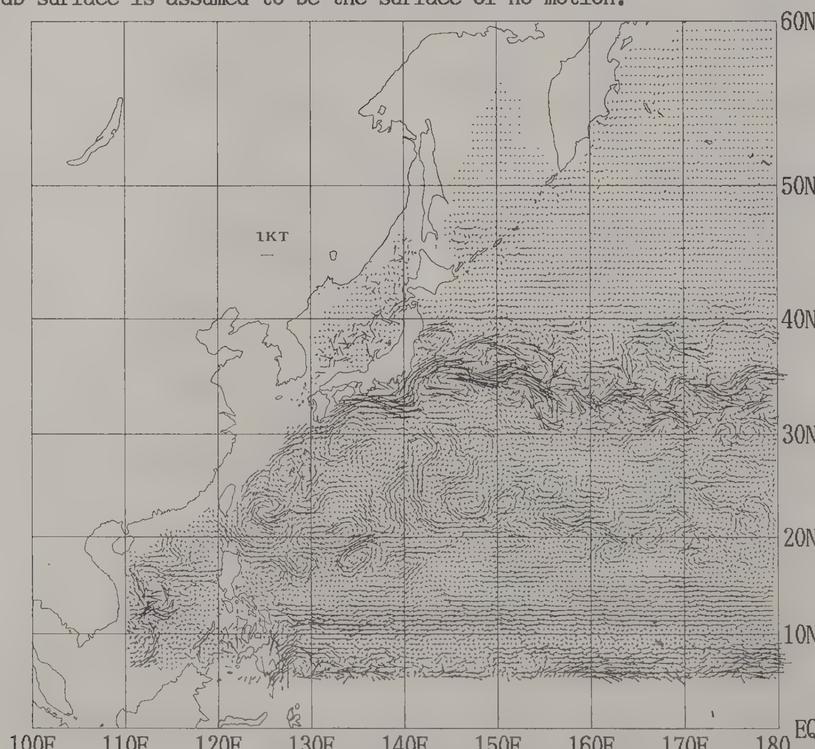
Fig.9 Location of the Kuroshio axis

Sea surface dynamic heights and current distribution



第10図 北西太平洋力学的海面高度分布図(2000年10月22日)

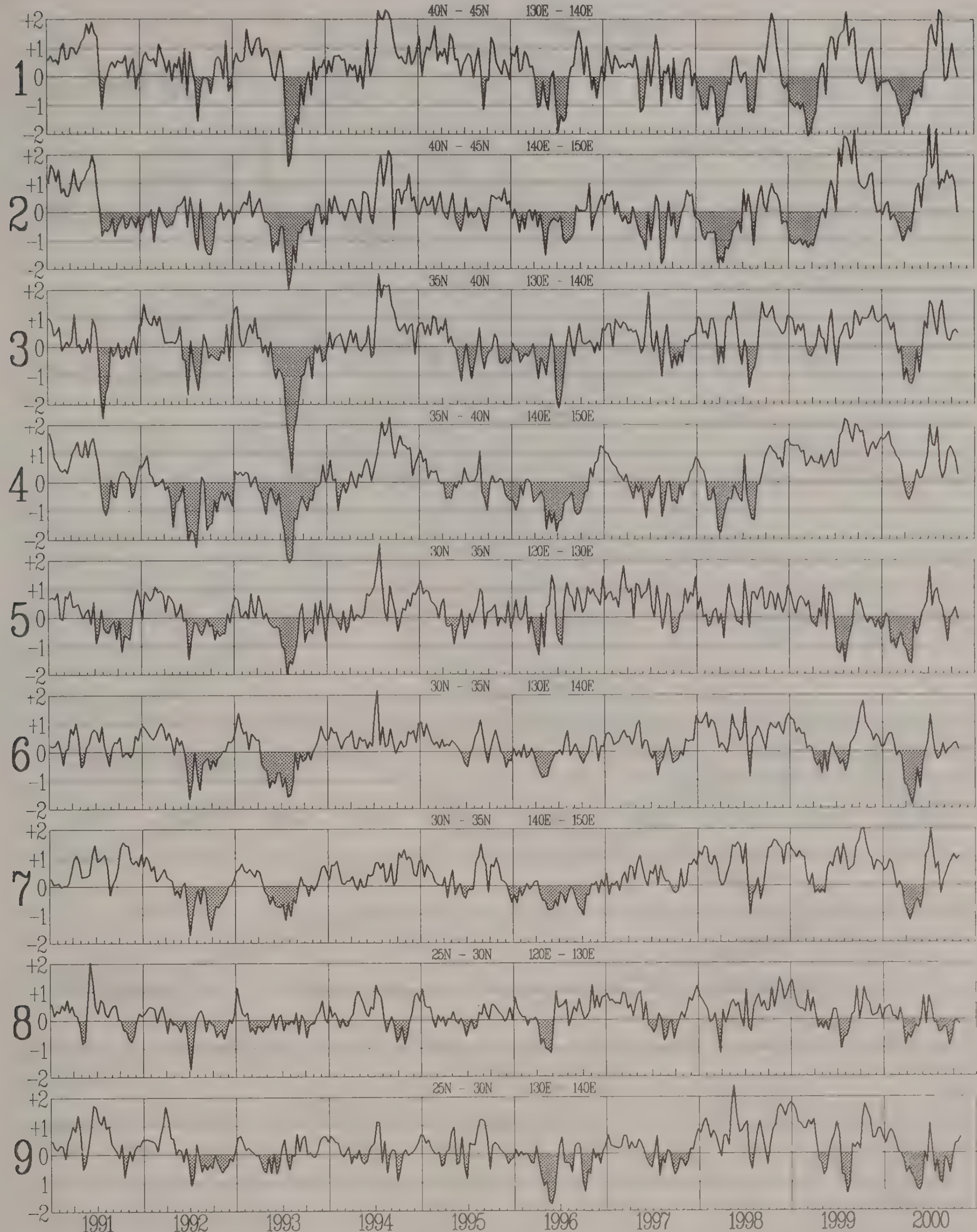
Fig.10 Sea surface dynamic heights (10 cm) in the western North Pacific derived from the altimeter data of TOPEX/POSEIDON (OCT 22, 2000).
1500 db surface is assumed to be the surface of no motion.



第11図 北西太平洋海流ベクトル図(2000年10月22日)

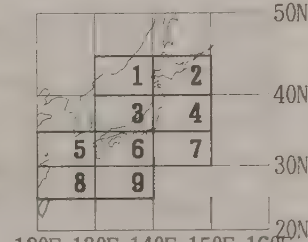
Fig.11 Sea surface current vectors in the western North Pacific (OCT 22, 2000).
Vectors are derived from the sea surface dynamic heights from TOPEX/POSEIDON and subsurface temperature distribution assuming the geostrophic relation.

Time Series of Area Mean SST in the Western North Pacific

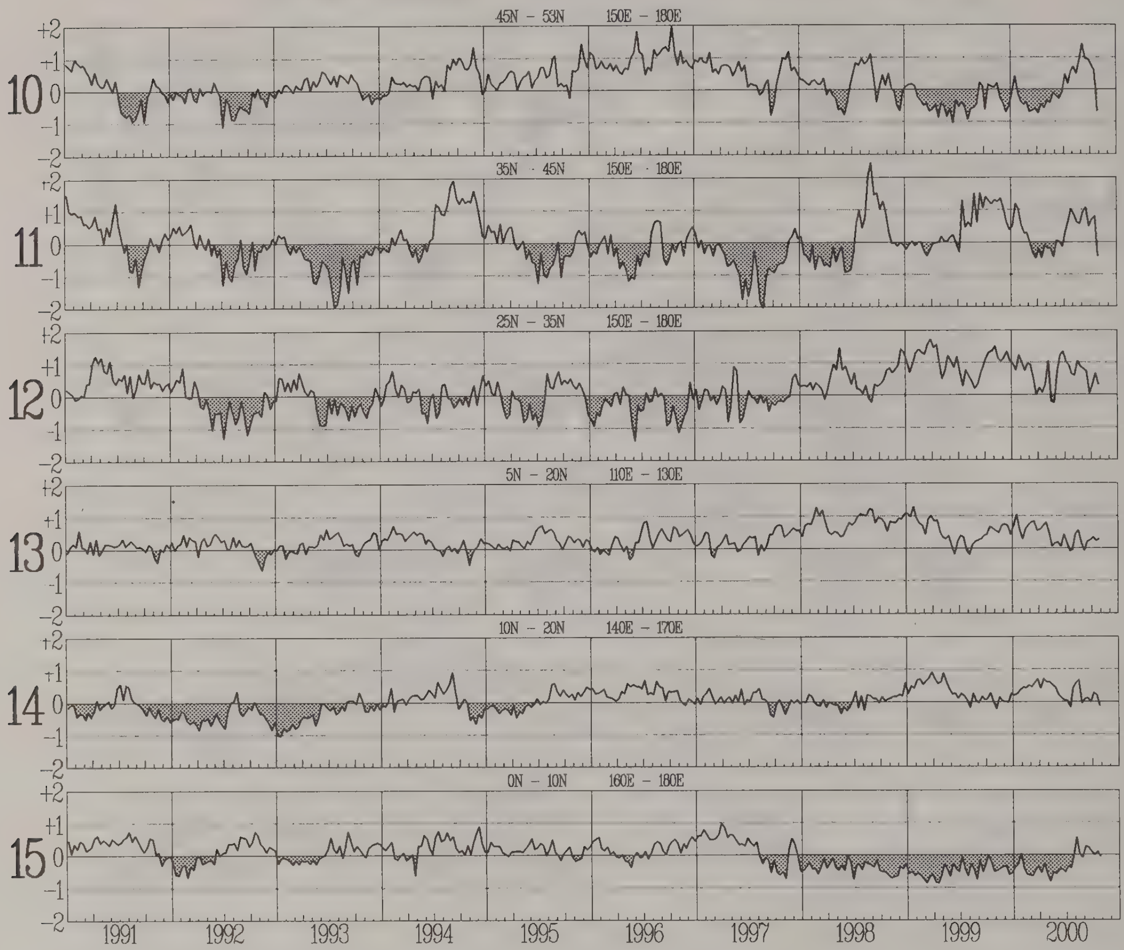


第12図　海域別旬平均海面水温平年偏差時系列図

Fig.12 Time series of the ten-day mean sea surface temperature anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1961-90).

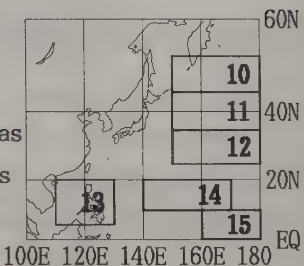


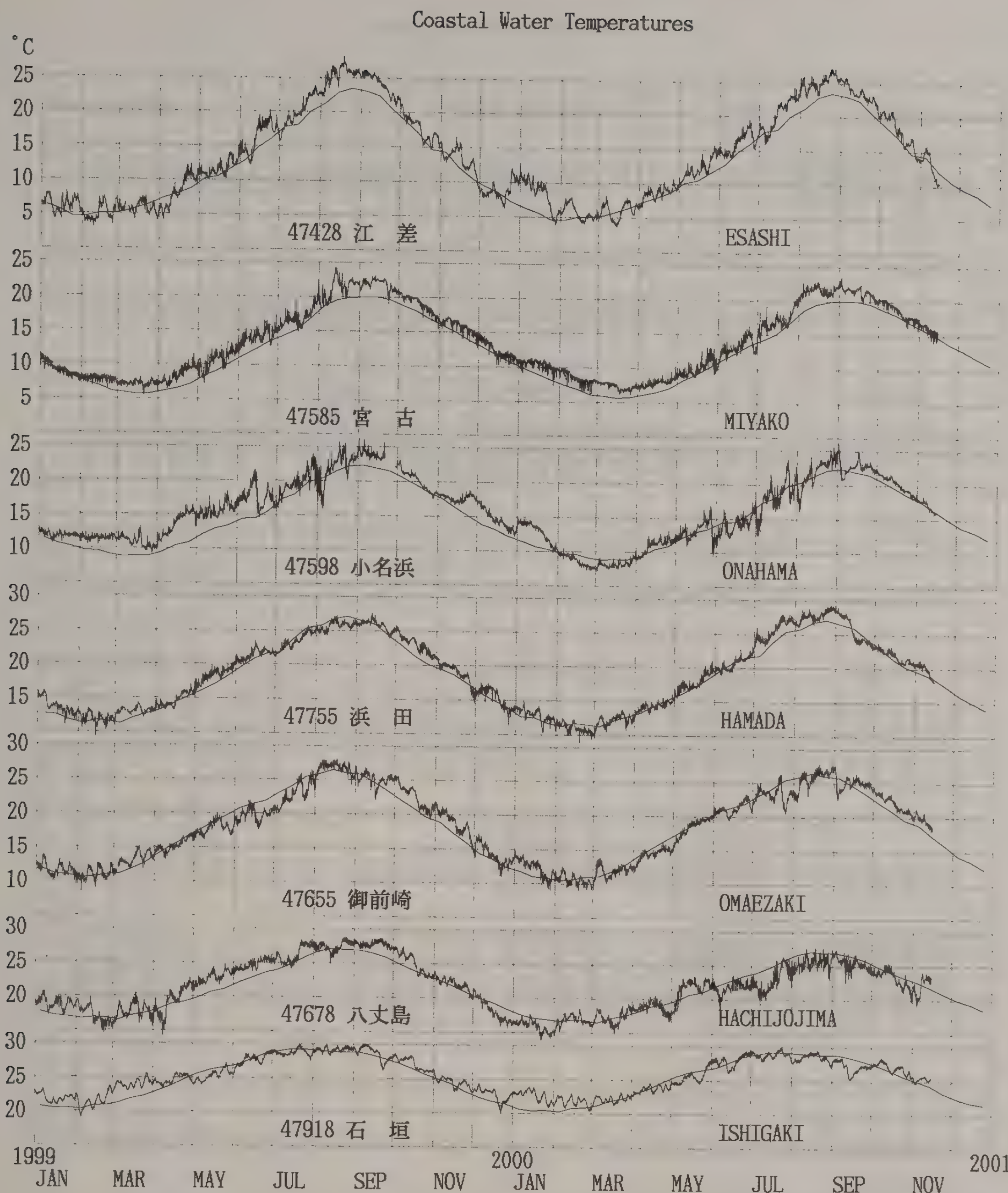
Time Series of Area Mean SST in the Western North Pacific

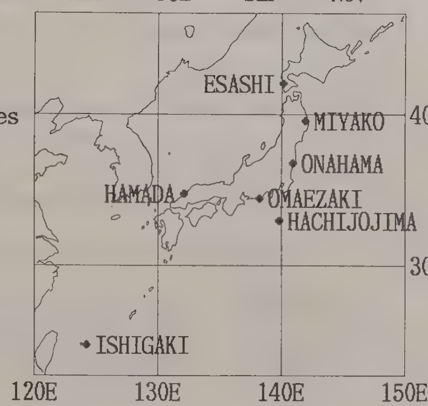


第12図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig.12 (continue) Time series of the ten-day mean sea surface temperature anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1961-90).



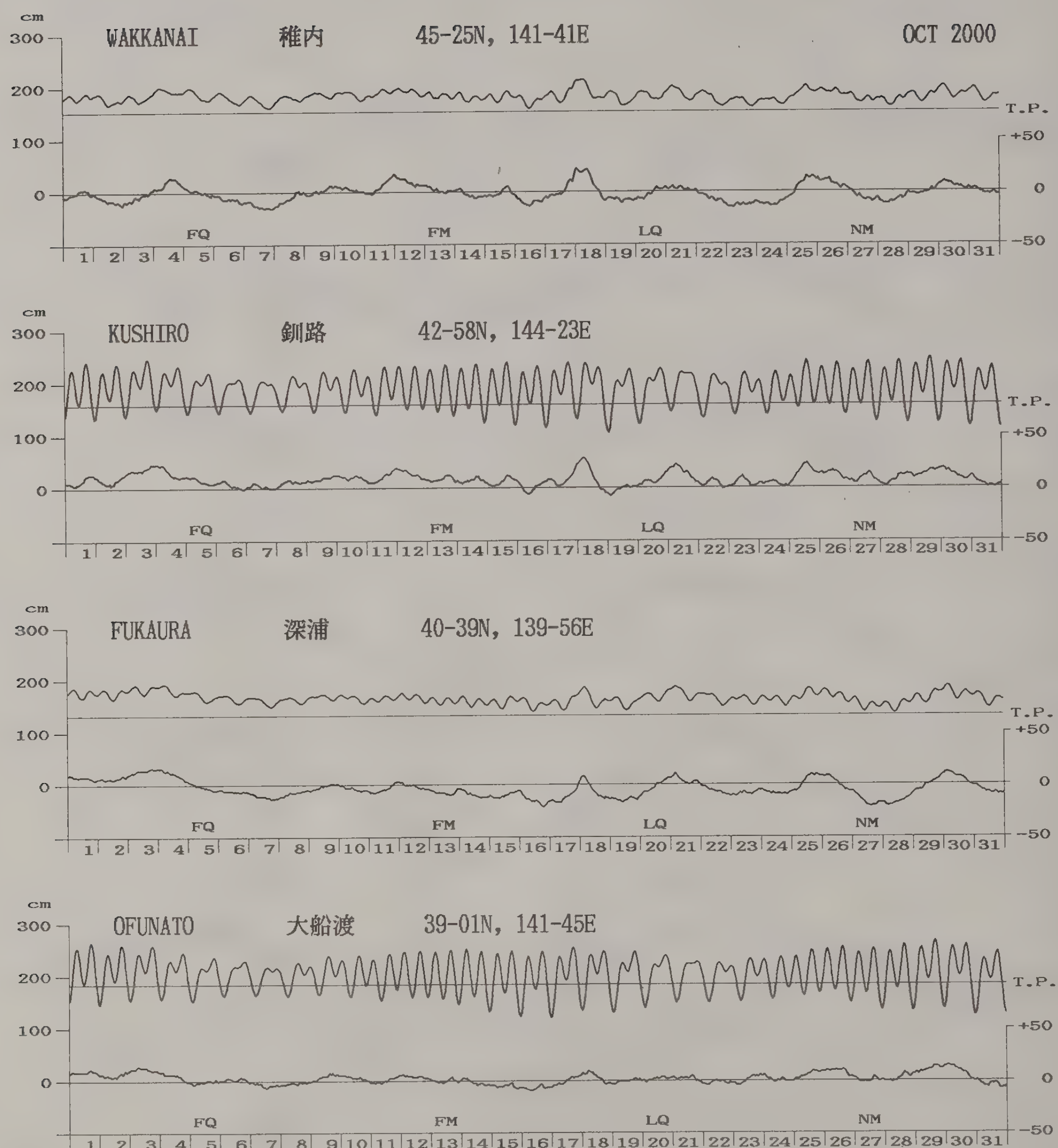




第13図 沿岸水温時系列図

Fig.13 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.
Thin lines show ten-day mean climatology.

Time Series of Sea Level



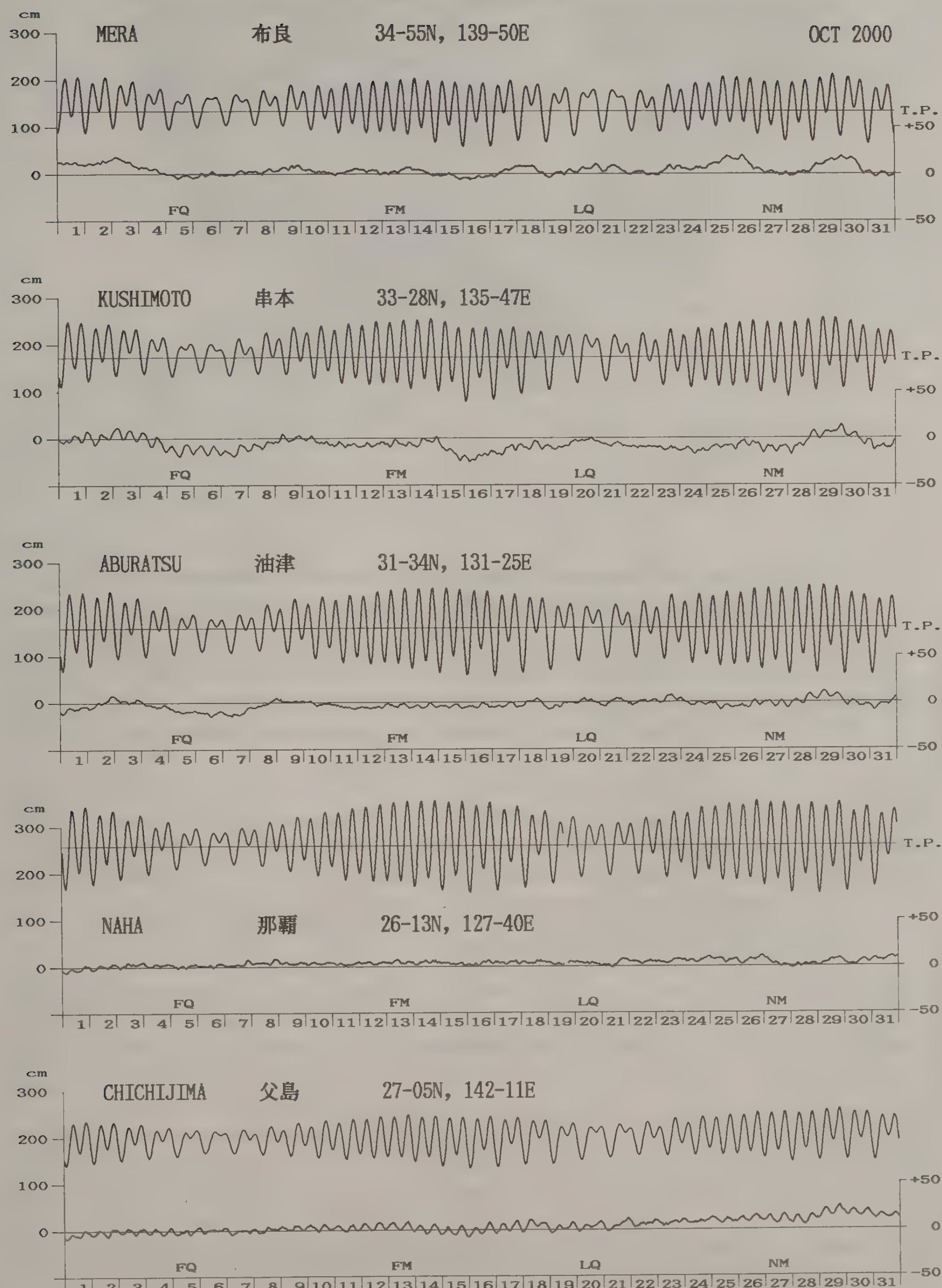
第14図 沿岸潮位時系列図 (2000年10月)

Fig.14 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

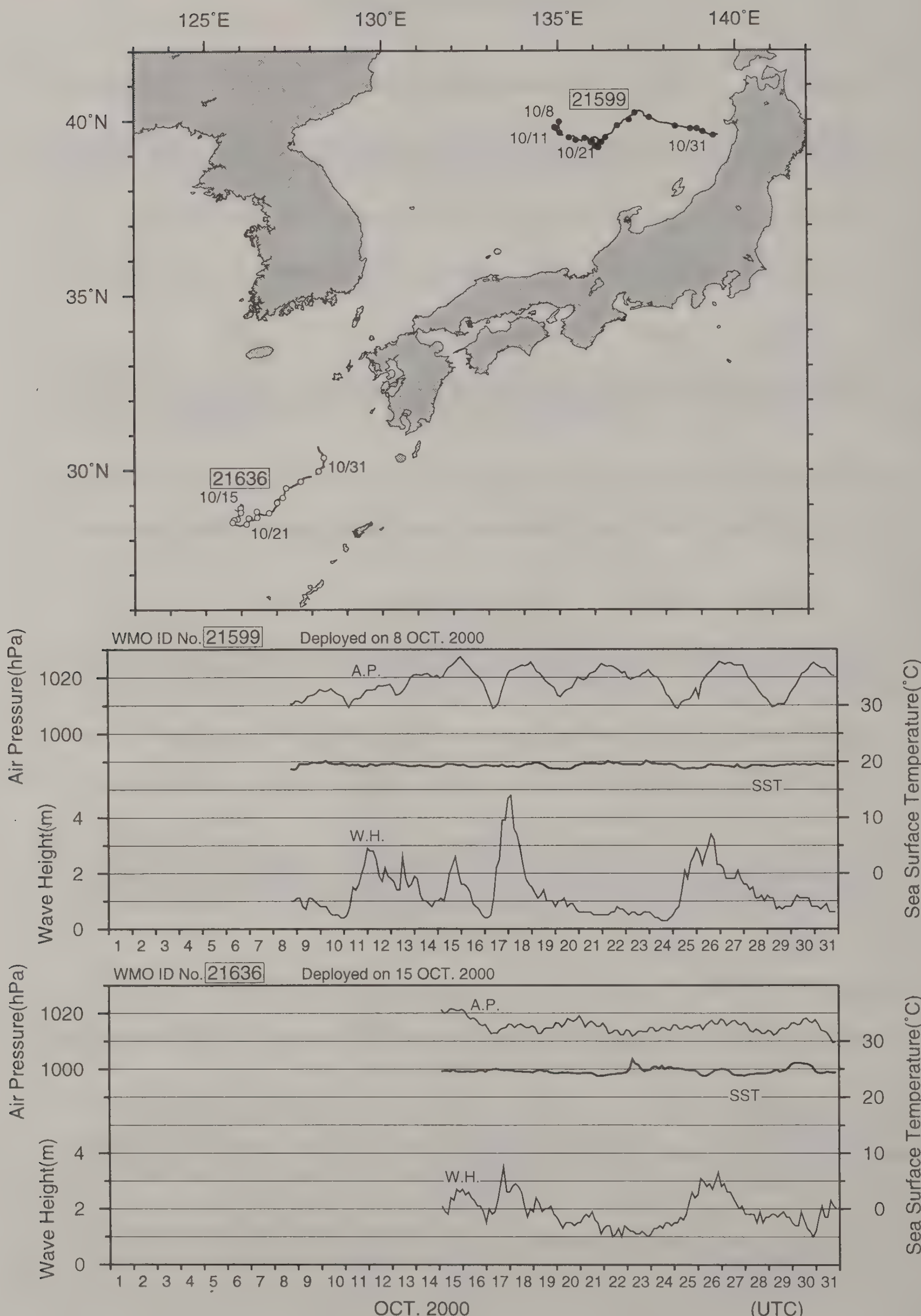
NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T.P.: Mean sea level of Tokyo Bay (Tokyo Peil)



Time series of Sea Level

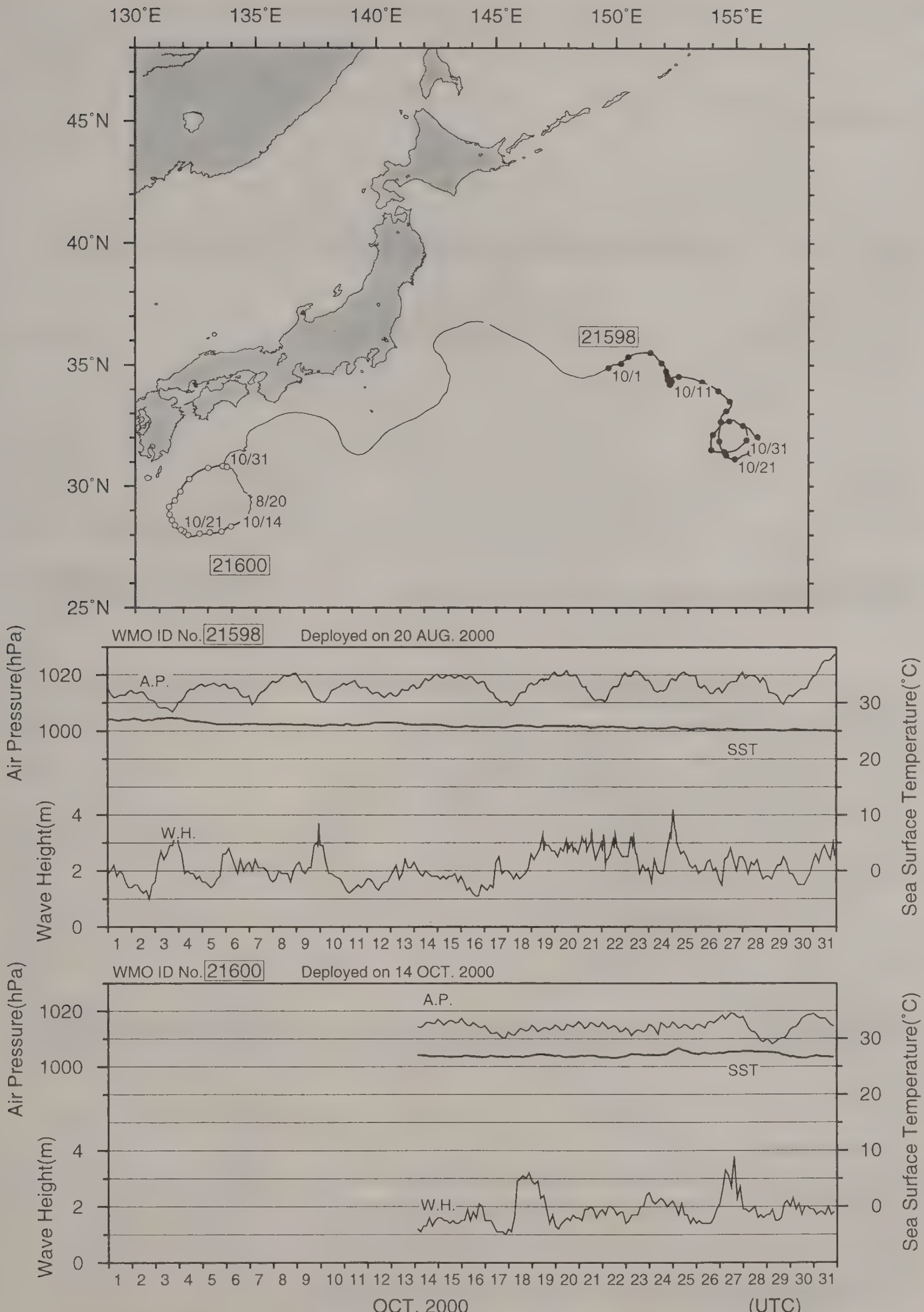


第14図 つづき
Fig.14 continue



第15-1図　漂流型海洋気象ブイロボットの軌跡と観測要素の時系列図

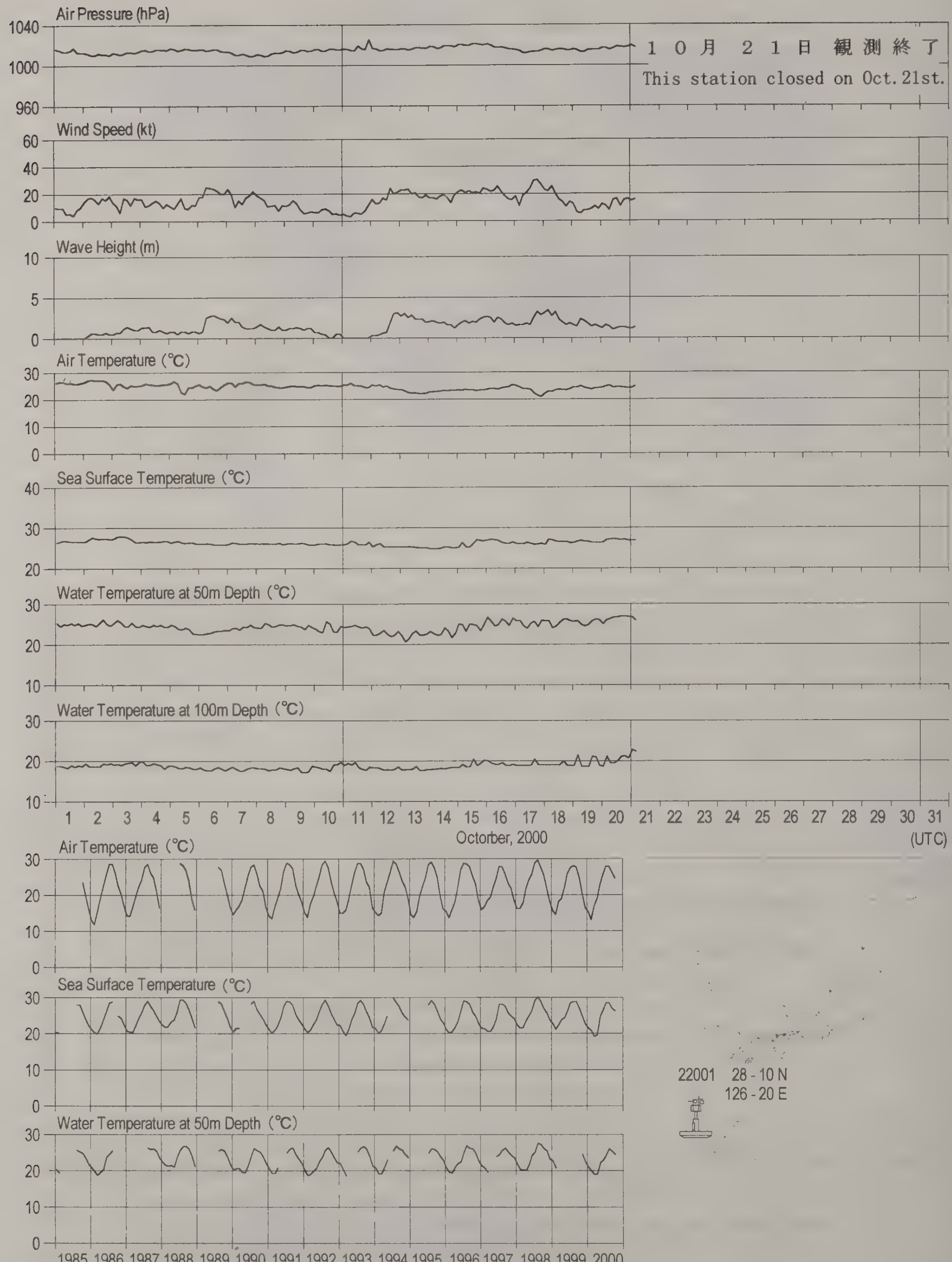
Fig.15-1　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.



第15-2図　漂流型海洋気象ブイロボットの軌跡と観測要素の時系列図

Fig.15-2　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.

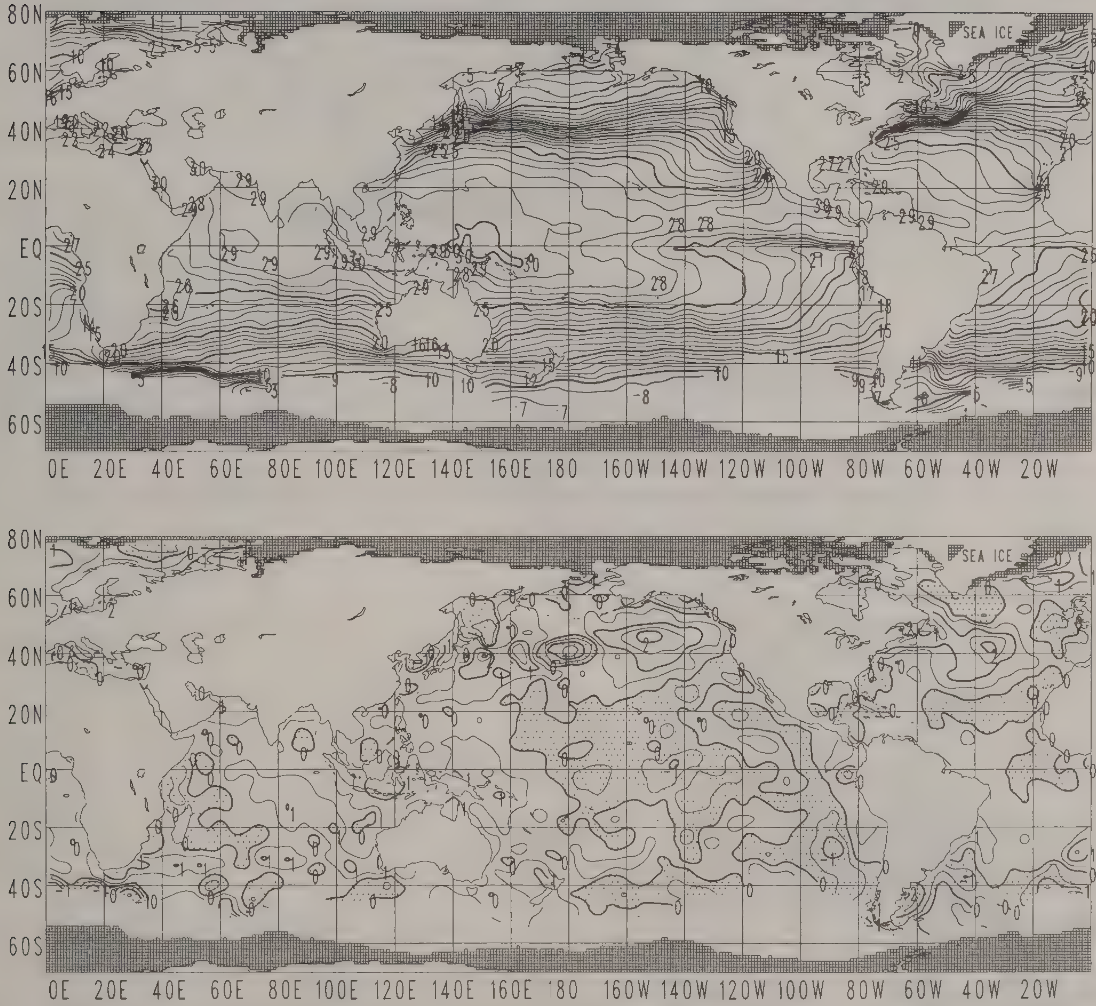
Ocean Data Buoy Observations



第15-3図 海洋気象ブイロボットによる観測要素の時系列図（東シナ海：22001）
上段は3時間毎の観測値を、下段は月平均値を示す。

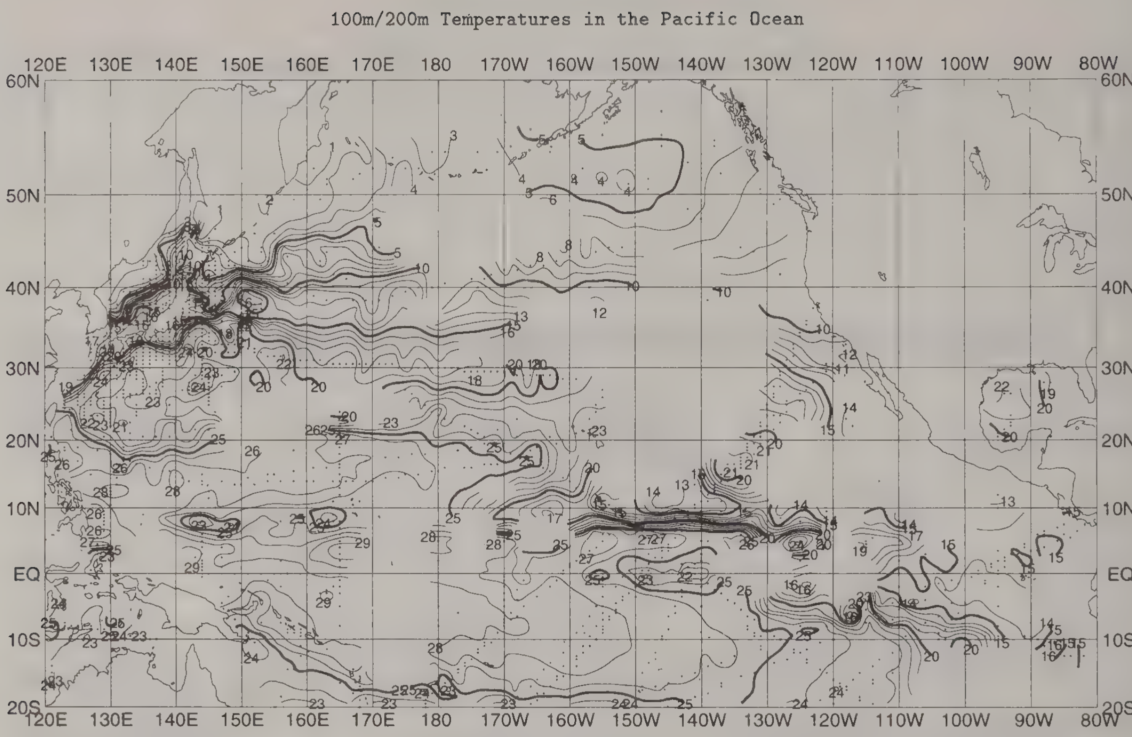
Fig.15-3 Time series of JMA buoy observation in the East China Sea (WMO ID No. 22001).
The upper panel shows three hourly observation and the lower panel shows the monthly mean data.

SST & Anomalies in the Global Ocean



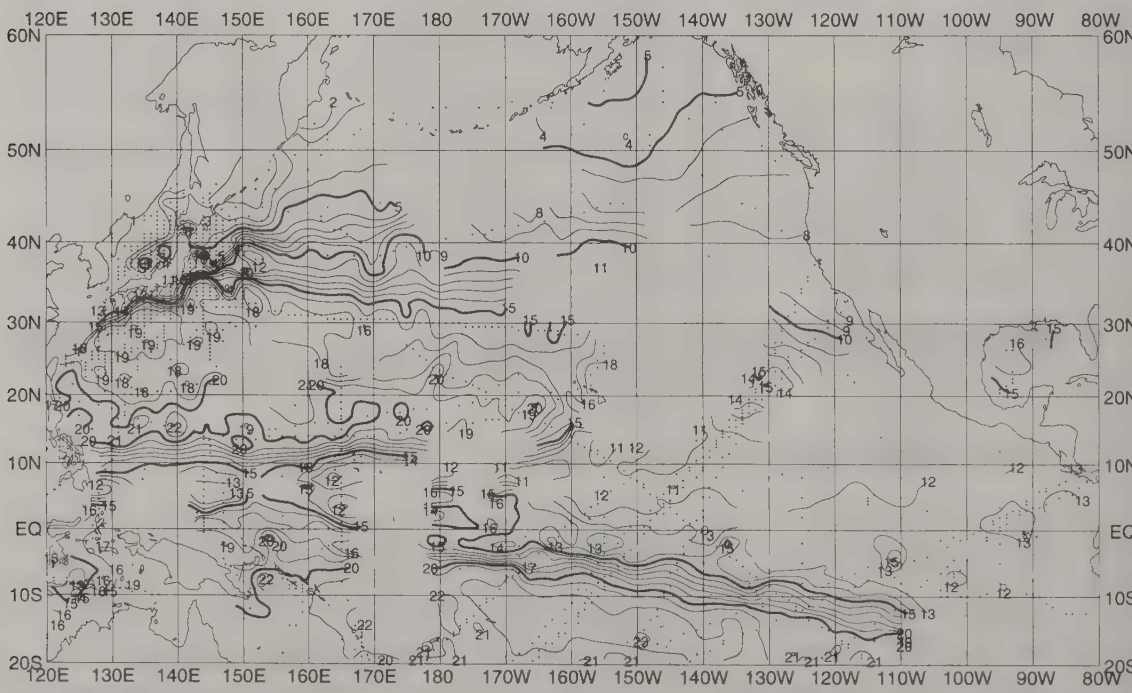
第16図　全球月平均海面水温図（上）及び偏差図（下）（2000年10月）

Fig.16 Monthly mean sea surface temperature over the global ocean (top) and anomalies (bottom) for OCT 2000. Anomalies are computed from the JMA climatology (1961-1990). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



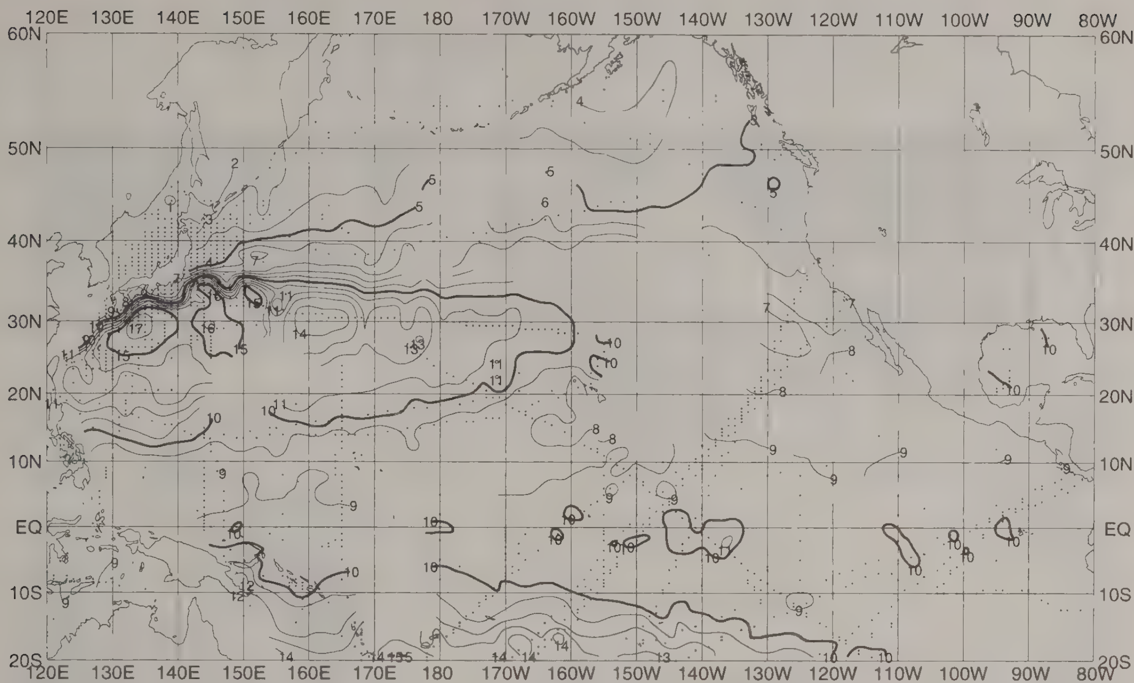
第 17 図　太平洋表層水温図（深さ 100 m）　(2000 年 10 月)

Fig. 17　Subsurface (100 m) temperatures in the Pacific Ocean for October 2000. Contour interval is 1 ℃. Observation points are denoted by dots.



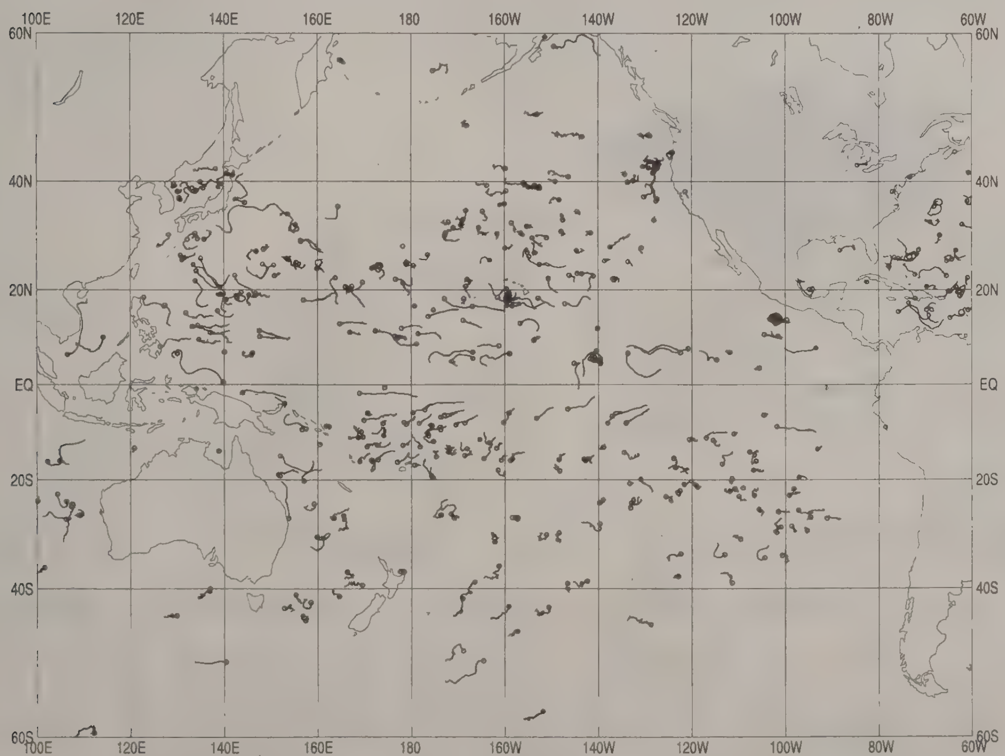
第 18 図　太平洋表層水温図（深さ 200 m）　(2000 年 10 月)

Fig. 18　Subsurface (200 m) temperatures in the Pacific Ocean for October 2000. Contour interval is 1 ℃. Observation points are denoted by dots.



第 19 図　太平洋表層水温図（深さ 400 m）（2000 年 10 月）

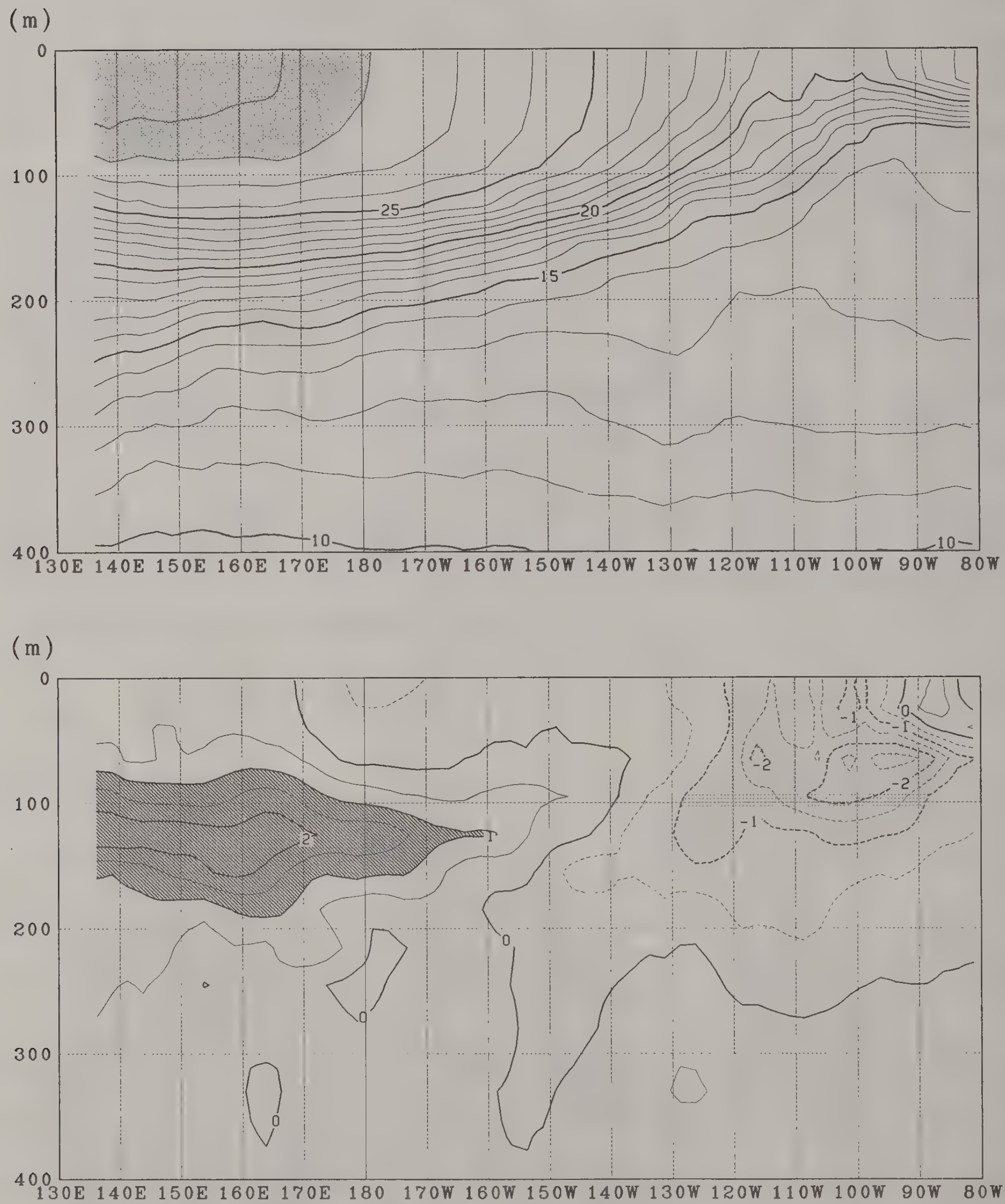
Fig. 19　Subsurface (400 m) temperatures in the Pacific Ocean for October 2000. Contour interval is 1 ℃. Observation points are denoted by dots.



第 20 図　太平洋ブイ流跡図（2000 年 10 月）

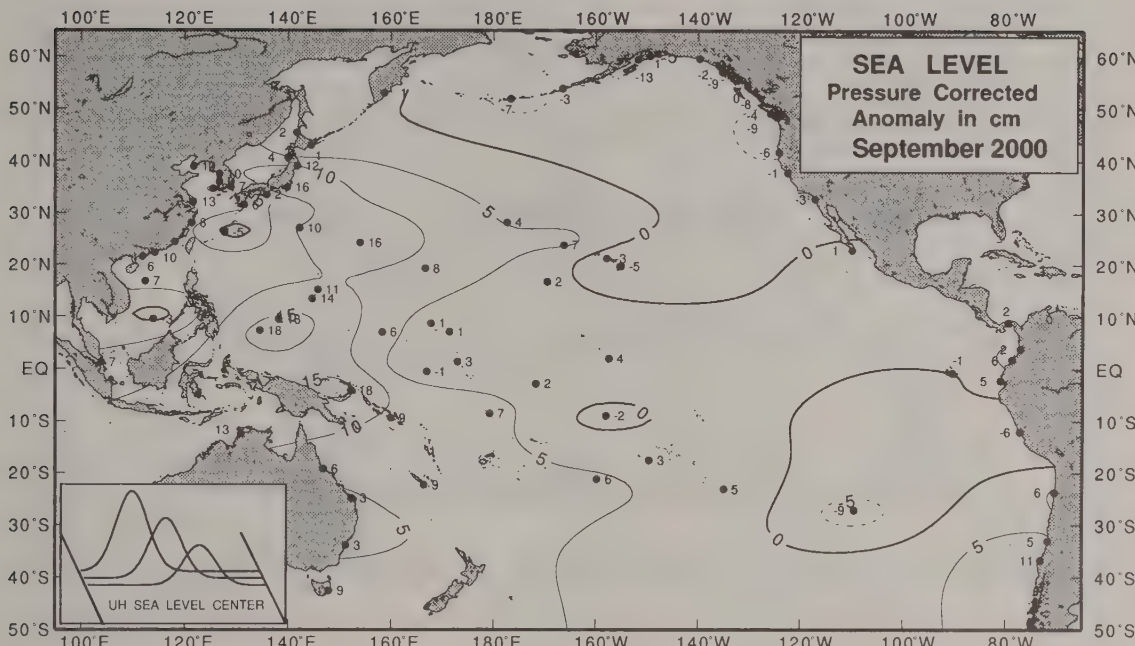
Fig. 20　Movements of drifting buoys in the Pacific Ocean during October 2000. Each track is for one buoy. Small circles represent the last positions for the month.

Depth-Longitude Sections of Equatorial Temperature & Anomalies



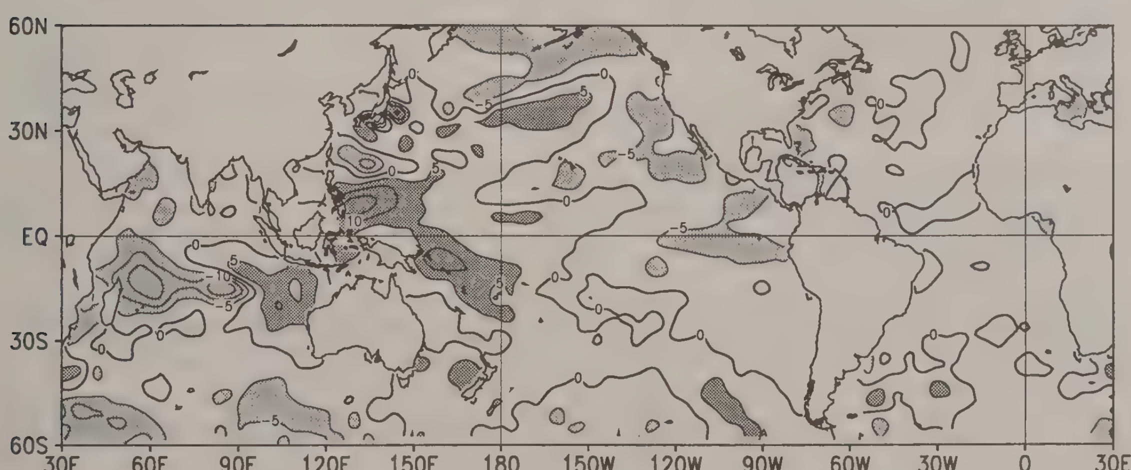
第21図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2000年10月）

Fig.21 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for OCT 2000. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-1999 base period means.



第 22 図　太平洋月平均海面水位偏差図 (2000 年 9 月)

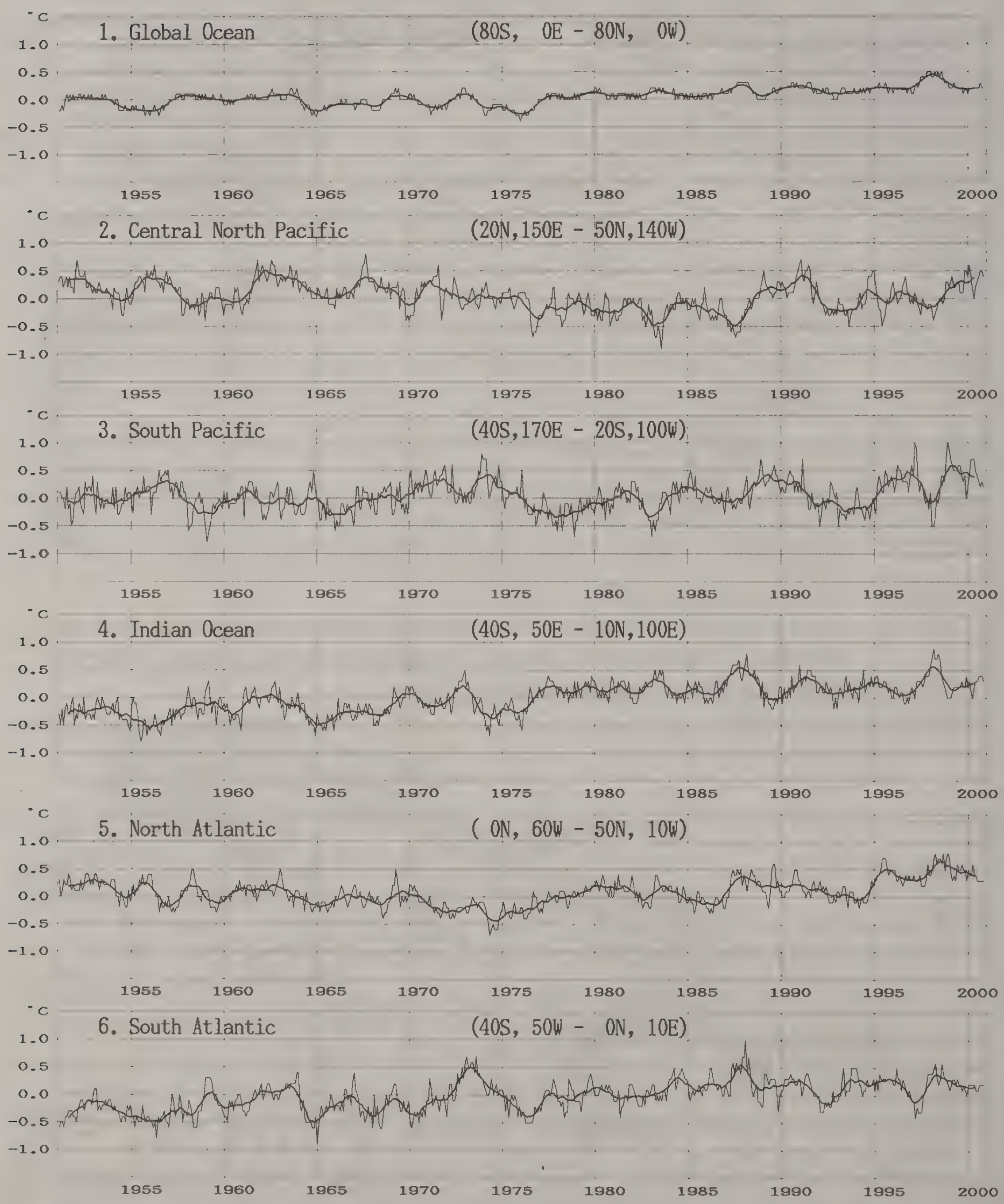
Fig. 22　Monthly sea level anomalies for September 2000 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 23 図　全球月平均海面高度偏差図 (2000 年 9 月)

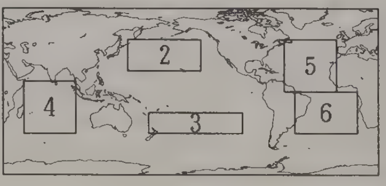
Fig. 23　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of TOPEX/POSEIDON for September 2000. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies

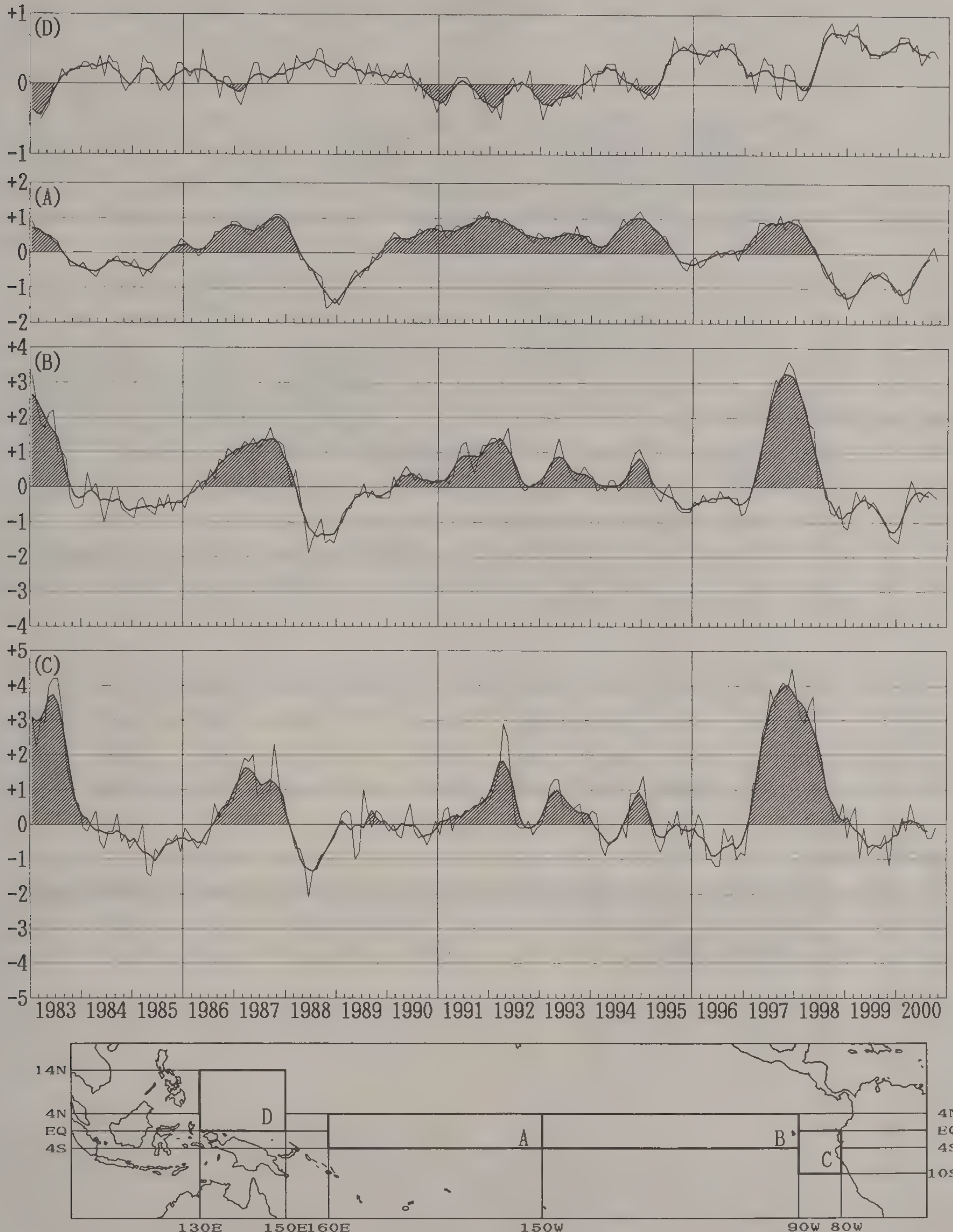


第24図 海域平均海面水温偏差の長期変動

Fig.24 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1961-90). Thin lines show the monthly mean and thick lines their 13-month running means.



Time Series of Equatorial Pacific SST Anomalies



第25図　太平洋赤道域の海面水温偏差時系列図

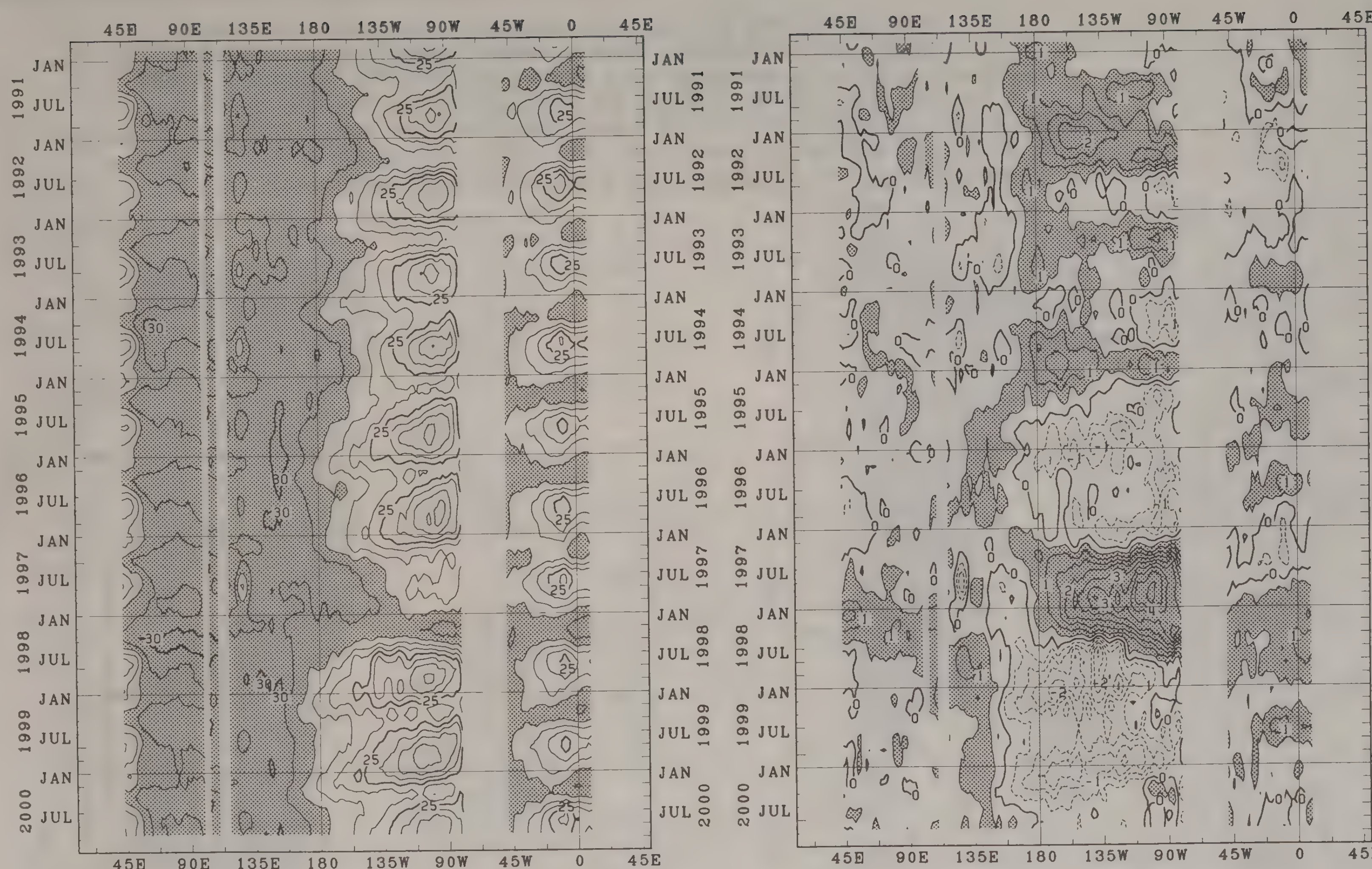
Fig.25 Time series of monthly mean SST anomalies (°C) in the equatorial Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1961-1990).

El Nino Monitoring Indices

MONTH YEAR	SEA SURFACE TEMPERATURE AND ANOMALY (°C) REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	SEA LEVEL PRESSURE ANOMALY (hPa) TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 98	28.3	-0.2	29.0	1.0	28.4	3.0	28.0	3.7	-2.3	-3.6	1.4
FEB 98	28.1	-0.2	28.8	0.8	28.8	2.6	28.8	3.1	-1.8	-0.9	3.5
MAR 98	28.3	-0.1	28.6	0.5	29.0	2.1	28.8	2.9	-2.5	-2.8	2.3
APR 98	28.8	0.0	28.5	0.3	28.9	1.8	28.5	3.4	-2.3	-1.5	1.4
MAY 98	29.3	0.2	28.7	0.2	28.3	1.7	27.6	3.7	0.0	0.4	0.5
JUN 98	29.7	0.4	28.4	-0.1	26.1	0.0	24.7	2.0	1.1	0.9	-0.5
JUL 98	29.9	0.7	28.0	-0.5	25.3	0.1	23.2	1.6	1.5	1.8	-0.6
AUG 98	29.9	0.8	27.7	-0.7	24.5	-0.1	21.7	1.1	1.0	1.4	-0.2
SEP 98	30.1	0.9	27.8	-0.5	23.9	-0.7	21.0	0.7	1.0	1.4	-0.4
OCT 98	30.0	0.7	27.3	-1.1	23.8	-0.8	20.8	0.1	1.2	0.8	-1.1
NOV 98	29.9	0.7	27.2	-1.2	24.1	-0.5	21.6	0.1	1.0	0.4	-1.5
DEC 98	29.5	0.6	27.1	-1.1	23.8	-1.1	23.2	0.6	1.5	1.1	-1.5
JAN 99	29.3	0.8	26.4	-1.6	24.2	-1.2	23.9	-0.4	1.5	1.8	-1.5
FEB 99	29.1	0.8	26.7	-1.3	25.5	-0.7	25.9	0.2	0.8	1.3	-0.6
MAR 99	29.3	0.9	27.0	-1.1	26.8	-0.1	26.4	0.5	0.8	0.4	-1.3
APR 99	29.3	0.5	27.3	-0.9	26.7	-0.4	24.1	-1.0	1.8	1.3	-0.9
MAY 99	29.7	0.6	27.8	-0.7	26.4	-0.2	23.8	-0.1	0.3	1.1	1.1
JUN 99	29.7	0.4	28.0	-0.5	25.5	-0.6	21.8	-0.9	0.1	0.6	0.4
JUL 99	29.6	0.4	27.8	-0.7	24.8	-0.4	20.9	-0.7	0.5	1.0	0.1
AUG 99	29.5	0.4	27.8	-0.6	24.0	-0.6	20.0	-0.6	0.0	1.3	1.1
SEP 99	29.7	0.5	27.8	-0.5	23.8	-0.8	19.7	-0.6	-0.1	0.2	0.4
OCT 99	29.8	0.5	27.8	-0.6	23.6	-1.0	20.4	-0.3	1.1	1.2	-0.4
NOV 99	29.7	0.5	27.5	-0.9	23.2	-1.4	20.3	-1.2	1.1	1.2	-0.9
DEC 99	29.4	0.5	27.1	-1.1	23.4	-1.5	22.6	0.0	1.5	1.9	-0.9
JAN 00	29.2	0.7	27.0	-1.0	23.8	-1.6	24.0	-0.3	0.4	1.3	0.3
FEB 00	29.0	0.7	26.6	-1.4	25.3	-0.9	25.9	0.2	1.1	2.6	-0.2
MAR 00	29.1	0.7	26.7	-1.4	26.6	-0.3	25.7	-0.2	1.0	1.6	-0.3
APR 00	29.3	0.5	27.4	-0.8	27.3	0.2	25.7	0.6	1.4	0.8	-1.0
MAY 00	29.7	0.6	27.9	-0.6	26.5	-0.1	24.0	0.1	0.3	0.8	0.7
JUN 00	29.6	0.3	28.1	-0.4	25.7	-0.4	22.6	-0.1	-0.6	0.2	0.9
JUL 00	29.6	0.4	28.2	-0.3	25.0	-0.2	21.6	0.0	-0.3	-0.4	0.0
AUG 00	29.6	0.5	28.4	0.0	24.5	-0.1	20.2	-0.4	0.5	0.2	-0.6
SEP 00	29.7	0.5	28.5	0.2	24.4	-0.2	19.9	-0.4	0.9	1.6	-0.0
OCT 00	29.7	0.4	28.2	-0.2	24.3	-0.3	20.6	-0.1	0.9	0.2	-1.5

第1表　エルニーニョ監視指数

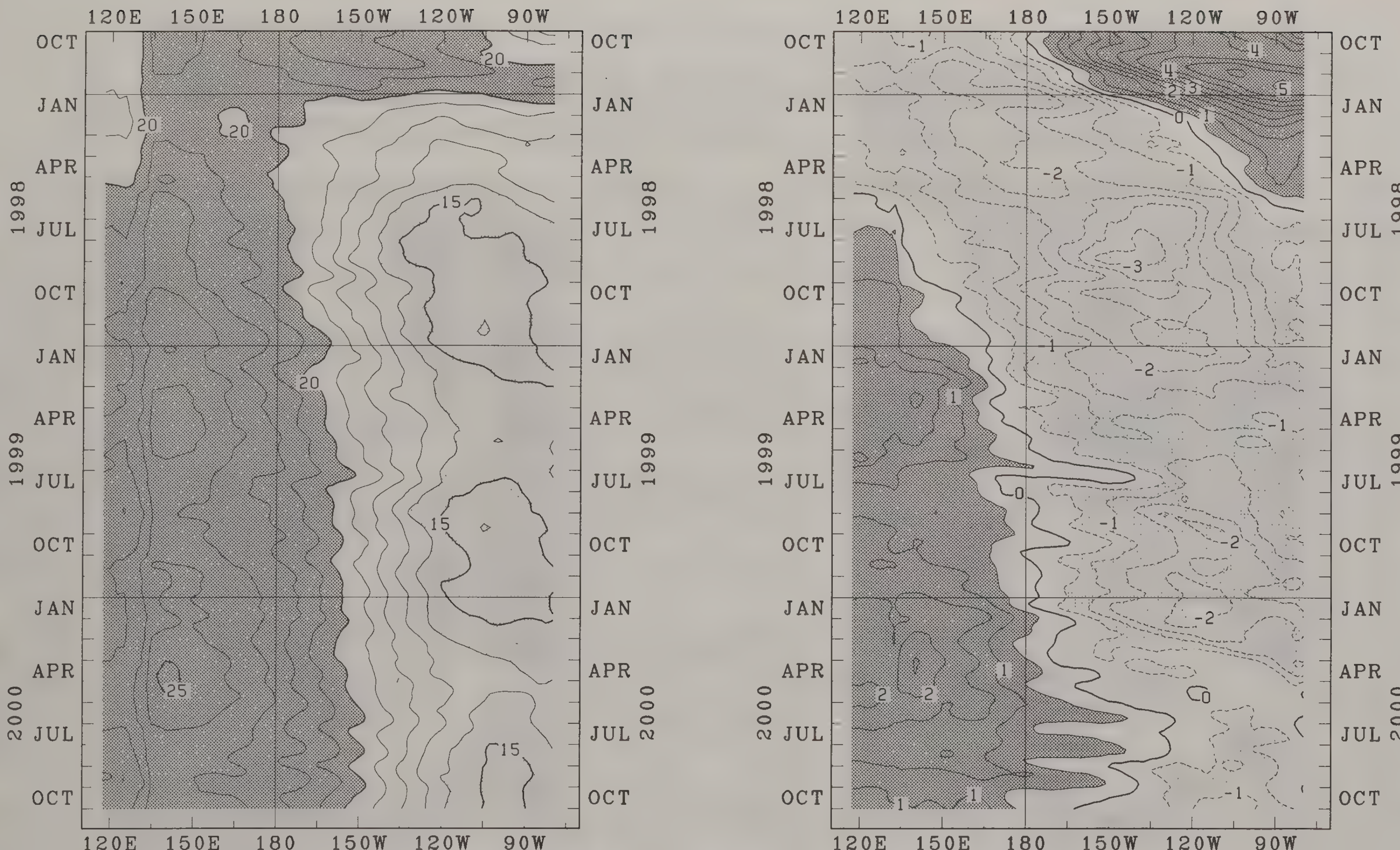
Table 1　El Nino Monitoring indices



第 26 図　赤道に沿った海面水温（左）及び偏差（右）の時間-経度断面図

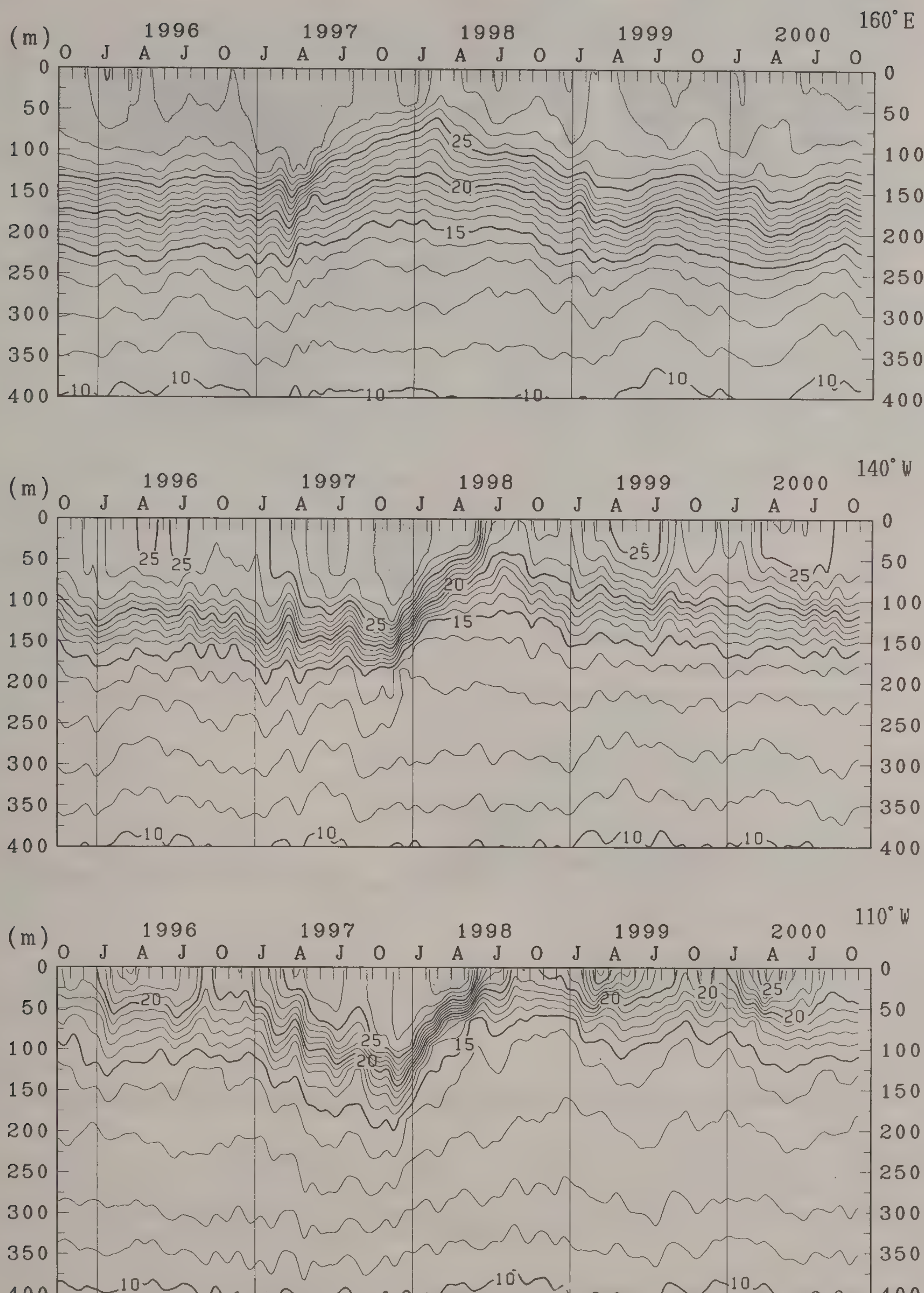
Fig. 26　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C are shaded and values less than 23 °C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1961-1990 base period means.

Time-Longitude Sections of Ocean Heat Content & Anomalies (Eq.)



第27図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

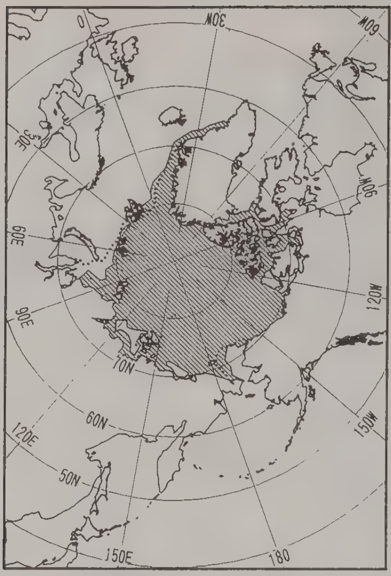
Fig.27 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-1999 base period means.



第28図　太平洋赤道域の表層水温の時間－深度断面図

（上：西部、中：中部、下：東部）

Fig.28 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.

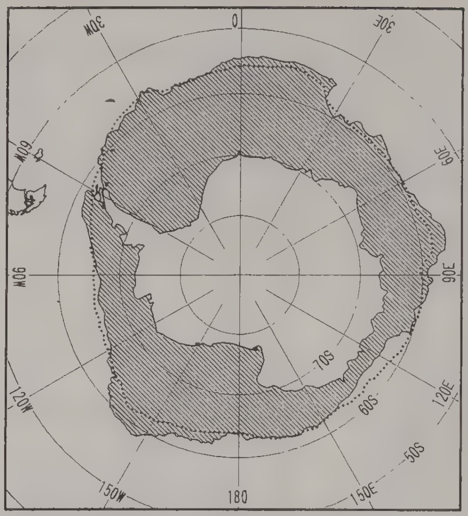


第29-1図　北極域の海氷図（2000年10月12日）

Fig.29-1 Sea ice chart in the Arctic on 12 Oct. 2000.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

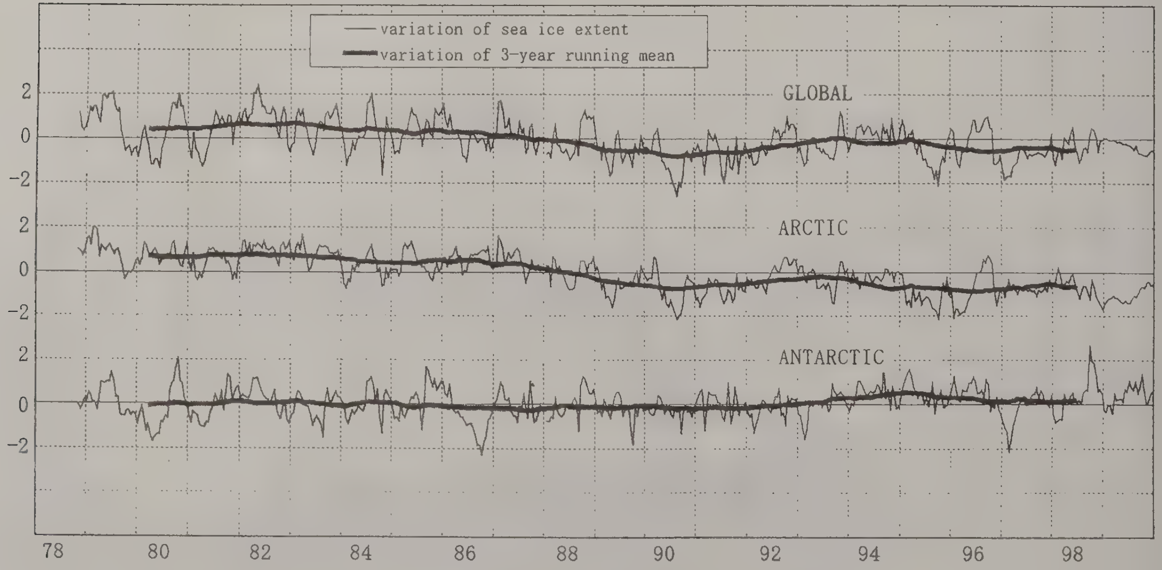


第29-2図　南極域の海氷図（2000年10月12日）

Fig.29-2 Sea ice chart in the Antarctic on 12 Oct. 2000.

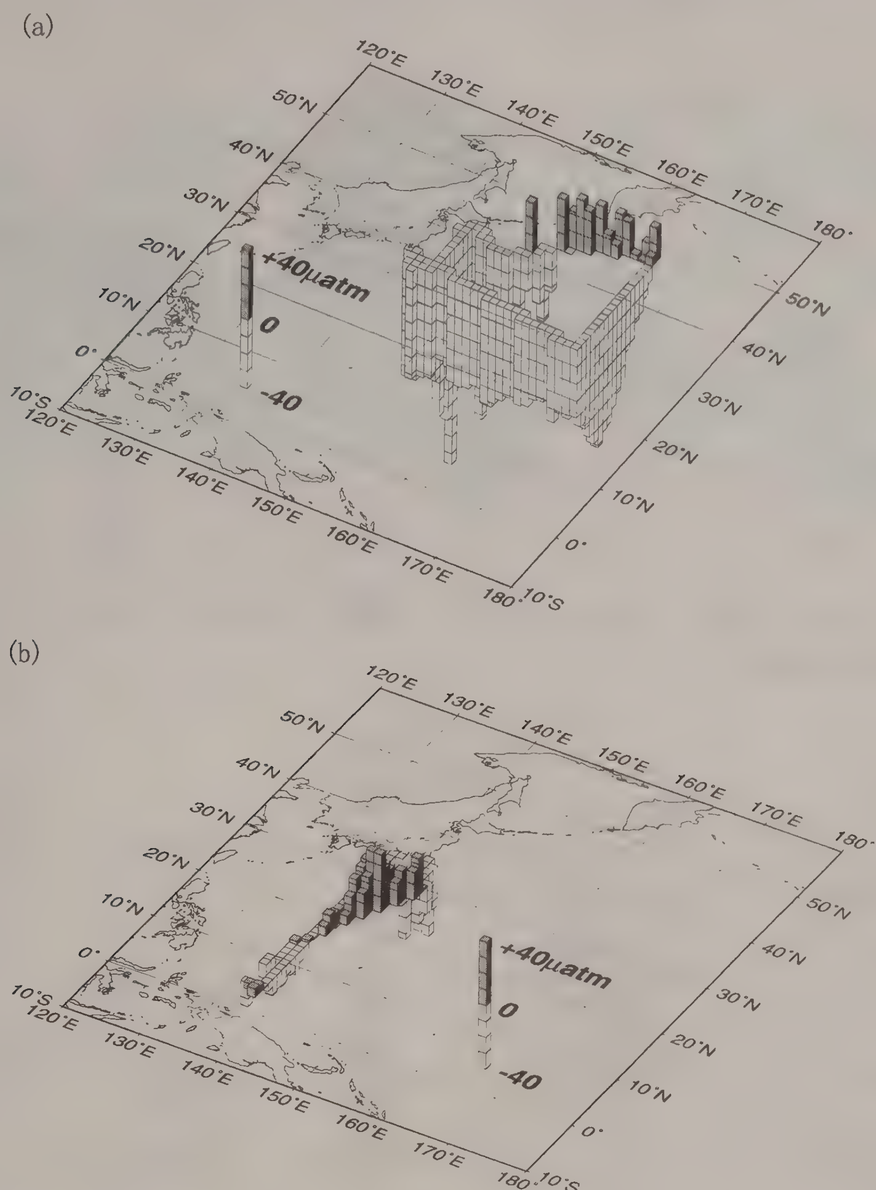
The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

The data source is the National Ice Center (USA).



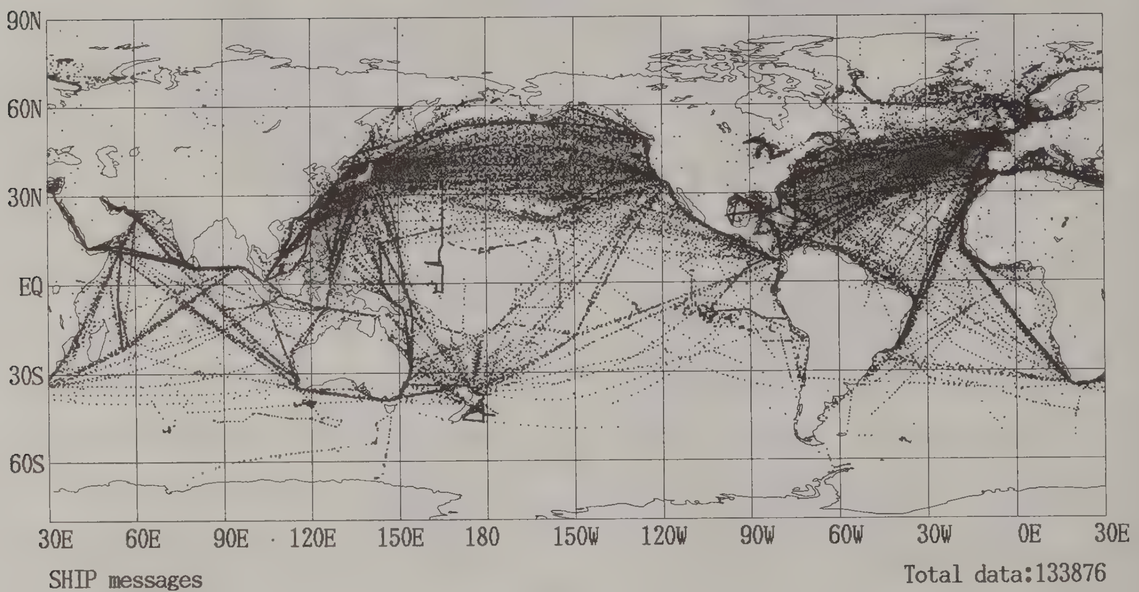
第29-3図 全球、北極及び南極における海氷域面積の偏差（平年差／標準偏差）の時系列図
資料は米国雪氷データセンター提供のSSM/Iデータによる
（縦軸の目盛りは標準偏差（全球71万km^2、北極56万km^2、南極67万km^2）を表す）

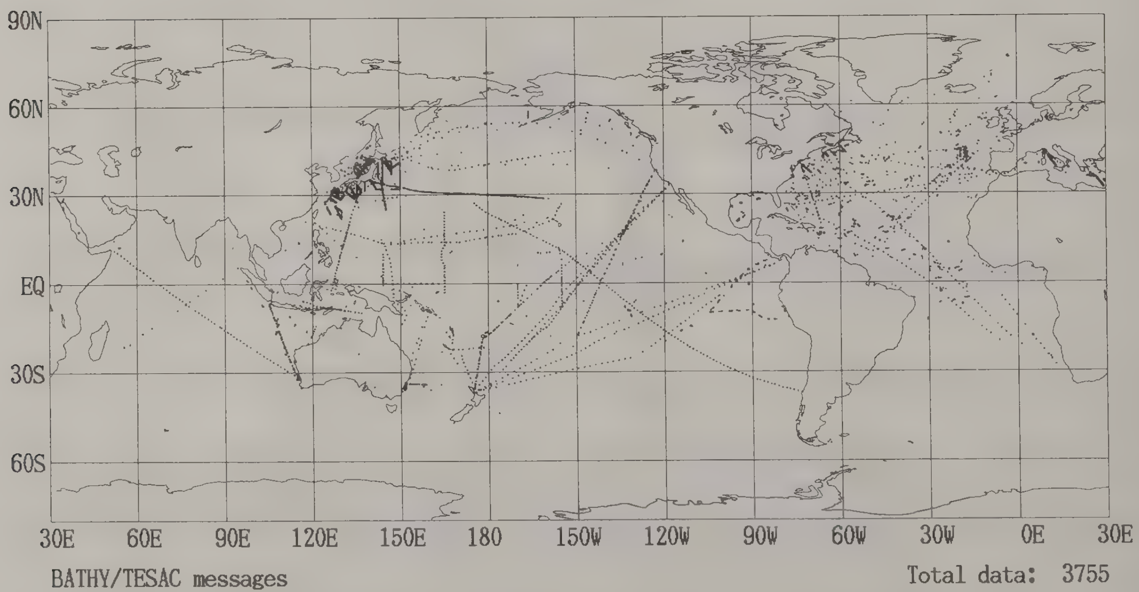
Fig.29-3 Time series of the deviation (deviation from normal)/(standard deviation) of Global, Arctic and Antarctic sea ice extent (Based on SSM/I data by National Snow and Ice Data Center,USA)
(Scale of the vertical axis indicates standard deviation (Global: 7.1×10^5 km^2, Arctic: 5.6×10^5 km^2, Antarctic: 6.7×10^5 km^2).)



第30図　気象庁の海洋気象観測船「凌風丸」が、(a)2000年4月21日から5月19日にかけて、(b)2000年6月21日から7月18日にかけて北西太平洋で観測した洋上大気中と表面海水中のCO_2の濃度差。棒グラフは、海洋から大気へCO_2を放出する場合を濃い陰影、および海洋が大気のCO_2を吸収する場合を薄い陰影に示してある。

Fig. 30　Difference in the CO_2 concentration between the surface water and the overlying atmosphere in the western North Pacific observed by the R/V Ryofu Maru of JMA, (a) from April 21 to May 19, 2000, (b) from June 21 to July 18, 2000. Darker-shaded upward pillars indicate that the oceanic CO_2 was emitted into the atmosphere, and lighter-shaded downward pillars indicate that the atmospheric CO_2 was absorbed into the ocean, respectively.

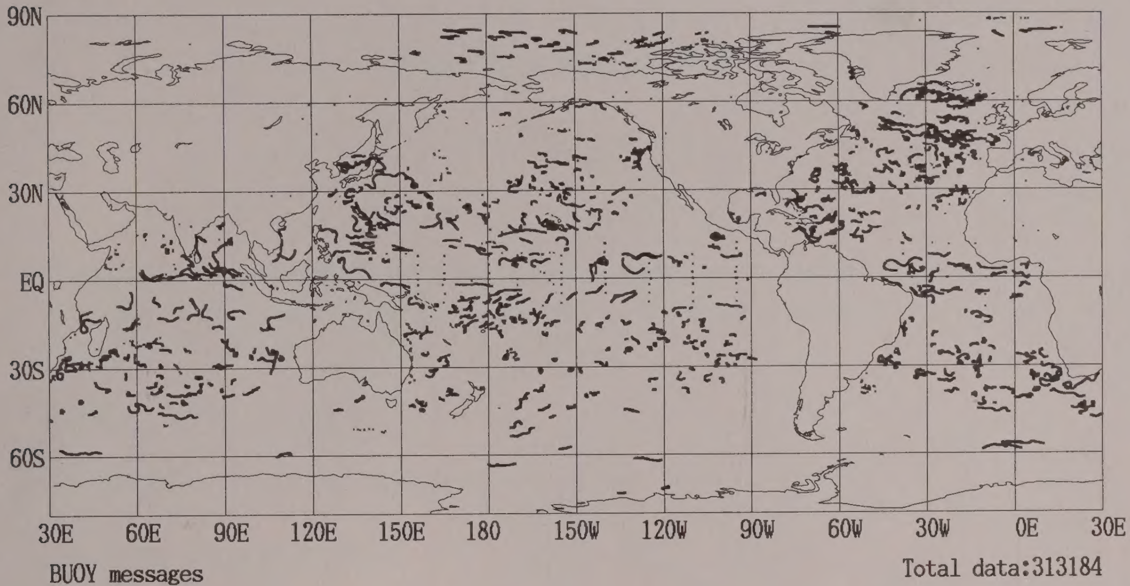


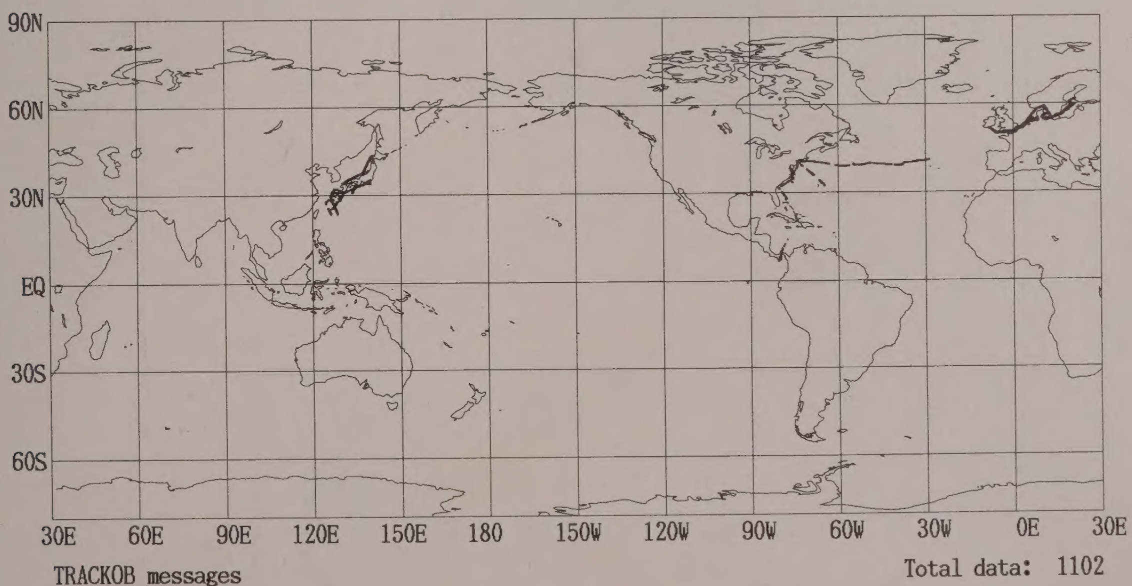


第31-1図　測点分布図(2000年10月)

Fig.31-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for OCT 2000.

Geographical Distribution of Oceanographic Data





第31-2図　測点分布図(2000年10月)

Fig.31-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for OCT 2000.

気 象 庁 海 洋 月 報

Monthly Ocean Report

October 2000 (No. 94)

本月報掲載の 2000 年 10 月のプロダクトには、気象庁が観測したデータ及び GTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

海洋科学技術センター、（社）漁業情報サービスセンター

東北大学、東京大学、鹿児島大学

水産試験場等（北海道、青森県、岩手県、宮城県、秋田県、山形県、福島県、茨城県、千葉県、東京都、新潟県、富山県、石川県、福井県、静岡県、愛知県、三重県、京都府、兵庫県、和歌山県、鳥取県、島根県、山口県、高知県、佐賀県、沖縄県）

（順不同）

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